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GEOGRAPHY AND THE UNITED NATIONS

By Jean Gottmann

Geographers are showing an increased interest in the part assigned to geography in the framework of the United Nations Organisation's activities. These activities are developing in several fields where the geographical factor is of indisputable importance. Boundary disputes in Greece, the organisation of a new free territory in Trieste, population and resources problems throughout the world, foundation of economic commissions with a regional competence such as Europe or Latin America : the instances are many which would require, in the geographer's opinion, the participation of experts thoroughly trained in geography.

There are few gatherings in this world which give one more the feeling of geography ' sitting at the table ' than a meeting at the United Nations. Most of the seats are marked with geographical names : those of the countries represented ; a great many of the speeches refer to some national attitude toward the question debated, and this attitude is often explained in terms of local conditions, needs or traditions. Geography, understood in its broadest sense, is indeed always present in the background—but one would have some difficulty in finding where the geographers are.

The Charter of the United Nations mentions geography specifically in only one case, and that is when attention is drawn to the necessity of an adequate ' geographical distribution ' in the appointment of the personnel of the uno. The ' geographical distribution ' is there to ensure a certain quota to the nationals of every member nation on the staff of the Organisation ; the way in which this quota is being assessed, however, could hardly be termed as being ' geographical.' It could not, of course, be based on the area, nor even on the population of the country concerned. Geography is mentioned merely to avoid that any nation be overlooked, and the application of this principle in practice is one of the delicate internal problems of the un administration.

Though geography is not mentioned by name elsewhere in the

Charter of the United Nations, it could be, because it is present. The distribution of anything, in addition to that of the UN personnel, insofar as it is distribution in space, is a matter of geography. And international relations, which are the major concern of the UN, predominantly consist in disputes or negotiations relating to distribution in space of lands, men, goods, or ideas. One cannot help wondering why so few geographers have as yet been employed in the various branches of the United Nations Secretariat and its specialised agencies.

A few geographers—less than a dozen altogether—have been, or still are, on the UN pay-roll. Professor John Wesley Coulter, who worked during 1949-1950 in the United Nations Trusteeship Department, once mentioned that the few geographers he knew at Lake Success have been called upon and were being utilised as " area specialists." That meant they had some detailed knowledge of a given area ; nevertheless, the principal contribution such an expert is permitted to make consists in helping to classify the data collected concerning that area. In the present form of its competence, the UN Secretariat is only a liaison institution which collects, files, puts in shape, and circulates whatever requests, information and data it may receive from the delegations of member nations. The national governments supply facts, figures, and interpretation. The Secretariat's main task is to classify and circulate these ; the preparation of statistical bulletins or year-books is a logical specialisation. The compilation of data about areas to be discussed is another indispensable function, especially for territories under UN trusteeship, and this explains the fact that several geographers have been employed by that Department. To be an " area specialist " turns out to be very nearly being a filing specialist. It must be kept in mind that the UN Secretariat is not supposed to be a policy-making body. That function is left to the Councils and Assembly of the Organisation—in other words, to bodies grouping national delegations. Important work, therefore, could be performed by geographers who might be attached to the delegations, or might work for them in their respective national services : the UN in this regard appears to be just one more series of international conferences. The geographers' part in these raises the whole problem of the use of geography in international relations.

The United Nations Secretariat has been concerned since 1946, however, with two projects of a definitely geographical nature, which are still being elaborated ; their past history and future developments may be of interest to many geographers. The writer was rather closely associated with both projects in their early stages ; he has always felt that geographers were entitled to a larger share in such consultations than they have as yet had. One of these two projects is usually referred to in United Nations circles as the question of international research laboratories ; the second is the project on the co-ordination of cartography.

Among the maze of ideas that surrounded the first steps of the UN Department of Social Affairs in 1946 was the idea of creating, under UN auspices, international centres of scientific research. The

Economic and Social Council adopted at its session of October, 1946, in New York, a resolution, submitted by the French delegation, directing the Secretary General to investigate this matter. The results of that inquiry were presented to the Council at its session of August, 1948, in Geneva, in a report by the Secretary General.[1] Further examination of the problem, in co-operation with UNESCO, was called for. The essence of the debate is now available in the form of a printed book,[2] on sale among other United Nations publications. Geographical research in many fields could find stimulating leads among the suggestions submitted by eminent scholars from many countries. It is interesting to find that the problems of soil and water conservation are given high priority not only by geographers or conservationists but also by famous physicists, such as Dr. Albert Einstein and Professor Theodor von Karmán.

The future historian may find that Dr. von Karmán's memorandum on fluid and soil mechanics laid the foundations for the proposal adopted in 1948 by UNESCO's General Conference to create an international institute for advancing research on problems of the world's arid areas. Two committees of experts have since met on this particular problem : at Lake Success, in August, 1949, under Professor Théodore Monod's chairmanship, and at Paris in November, 1949, under the chairmanship of Dr. W. C. Lowdermilk. Further consultations on this problem may be expected. The International Scientific Unions have been consulted. The IGU has mentioned it in its news-letter of June, 1950. To date, however, no geographers have participated in any of the international meetings called on that matter.

The arid areas project is perhaps the most ' geographical ' among the offshoots that the action started by the Economic and Social Council may bring about, either through UNESCO or any other UN agency. Much more would already have been done if some groups of geographers had been able to interest their own national delegations at the United Nations or in some specialised agencies to stimulate work in one of the directions pointed out in the Secretary General's report on research laboratories. What a group of physicists achieved in connection with the arid areas study ought to be quoted as an example.

The project on the co-ordination of cartography started at about the same time. This writer attended in the capacity of a United Nations observer at the 4th general assembly of the Pan-American Institute of Geography and History, meeting at Carácas, in August, 1946. The Commission on Cartography of that Institute appeared eager to make some suggestions as to the establishment of an international centre for cartography under UN authority. In January, 1947, three communications suggesting action by the United Nations in that field were received by the Secretary General : from the United States delegation, the Pan-American Institute of Geography and History,[3] and the French delegation,[4] mainly concerning hydrographic maps and charts. Favourable reactions came from the President of the International Geographical Union, then Professor Emm. de Martonne,[5] from the International Council for the Exploration of the

Sea,[6] and from the Second General Conference of UNESCO which adopted a resolution on " cartographic science." [7] At the same time the United Nations Department of Information had a documentary film prepared, under supervision by the National Film of Canada, on the history of maps and map-making.

Meeting at Lake Success in February, 1948, the Economic and Social Council adopted a resolution, submitted by the Brazilian delegation,[8] calling for an inquiry by the Secretary General in the matter of the co-ordination of cartographic services of different United Nations agencies, and also calling for stimulation of national programs of surveying and mapping. A meeting of experts in cartography was recommended.

A preliminary consultation was held in Washington, D.C., between representatives of international organisations concerned, under the chairmanship of Mr. Robert H. Randall, executive vice-president of the Pan-American Institute of Geography and History. Dr. J. Fleming, President of the International Council of Scientific Unions, participated in it. The author of this article was there to represent the International Geographical Union by direction of its President, and Dr. T. L. Tchang, of the Department of Social Affairs, represented the UN Secretariat. The result of this consultation was then communicated by the Brazilian delegation to the Secretary General.[9] Then a committee of experts on cartography met at Lake Success in March, 1949. Its report [10] is now available in the form of a booklet entitled : *Modern Cartography. Base Maps for World Needs.*[11] This report indeed constitutes a welcome general survey and sets forth interesting recommendations, particularly for a United Nations Cartographic Office. The success of the meeting was due, in a large measure, to the devoted work of its chairman, Mr. Robert H. Randall.

In July, 1949, the Economic and Social Council, basing its deliberations on the experts' report and other investigations by the Secretary General, adopted a new resolution [12] jointly sponsored by the representatives of Brazil, Chile, France, India, Peru, the United Kingdom, and Venezuela. This resolution instructs the Secretary General :

" (1) to consult with Governments concerning the early calling of regional meetings on cartography to be attended by representatives of Governments having a common interest in a specific region ;

(2) to take the necessary steps at the earliest practicable moment for the co-ordination and development of the existing cartographic services into a cartographic office capable of dealing with the present and the growing needs of the United Nations, and of providing, in co-operation with international scientific organisations, such assistance as may be requested by the specialised agencies ;

(3) to continue such efforts as may be necessary in co-ordinating the plans and the programs of the United Nations and the specialised agencies in the field of cartography and also to offer assistance in the co-ordination of the programs of interested international scientific organisations ;

(4) to proceed with the selection of the recommended panel of consultants ;

(5) to publish periodical summaries on cartography that will constitute a report upon activities, progress and plans in this field, so that this exchange of systematically compiled information and experiences may facilitate the co-ordination of national programs and eliminate the duplication of costly experiments."

Finally, the Secretary General was requested to consider the possibility of integration in the United Nations the services planned by the Central Bureau of the International One Millionth Map of the World.

Some readers may comment that we listed above a great many documents and meetings while little action could be reported. Whoever knows the thorny and tricky ways of any national bureaucracy would be little surprised that all this, and perhaps much more that could not be listed, was necessary in an organisation whose aim is to avoid dissatisfying the majority of some sixty national administrations. Even if no practical action has been taken as yet, efficient propaganda has been achieved in favour of certain geographical problems and, indirectly, in favour of the profession in diplomatic circles. *Modern Cartography* [11] is a useful booklet on the present status of mapping. Neither the cartographic nor the research laboratories projects could have moved forward to any extent without the great interest displayed by the Assistant Secretary General of the United Nations in charge of Social Affairs, Professor Henri Laugier. He was assisted in an efficient and competent manner by a distinguished member of his staff, Dr. Te-Lou Tchang.

Several other projects which involve a good deal of geography have been, or still are, on the agenda of United Nations agencies : the problem of resources conservation, to which a special conference was devoted in August and September, 1949 ; the co-ordination of civil aviation information and standards—a major concern of the International Civil Aviation Organisation ; or the mapping of epidemiologic data—a concern of the World Health Organisation. All these are only instances : the United Nations as a whole is concerned with the organisation of the space inhabited by man, and it is also, we believe, the aim—and should be the definition—of geography.

A rapid survey of what geography and the geographers have so far meant within the United Nations framework leaves one with the definite feeling that, while the outstanding importance of geographical factors in many international problems is well recognised, professional geographers are localised in the reference and cataloguing levels of the work being performed. Few—almost exceptional—are the instances where one of them has been allowed to contribute at the policy-making or planning levels.

This leads to the question: Why did it happen that our profession did not receive more recognition? Perhaps because we did not attach enough importance to the work to be done in the United Nations; perhaps because the evolution of geography has led most of us more and more into micro-analysis, into technical details which are, on the whole, of little interest to a world undergoing such rapid and deep changes as ours is to-day. Economists have often

taken over the study and practice of the general principles and factors of evolution affecting the organisation of the world. Instead of remaining attached to the questions of environmentalism, of classification of various shapes whether of *thalwegs* or of habitat, geography may have turned back to those broad and permanent problems of the world's partitioning, of the systems of space organisation, or to regions and factors of regionalism, to regional planning, to the evolution of regions. Those were perhaps predominant in the minds of the leaders of the generation which in the 1890's-1900's laid the foundations of our science : Ratzel, Vidal de la Blache, Mackinder, W. M. Davis, and others. Since then we have divided the broad problems into an infinity of small ones ; we have found that it is just as difficult to overcome the lot of them as it was when our spiritual ancestors faced the main obstacles in their entirety. It has become almost ' unscientific ' to attempt again to solve the large issues. But our epoch faces large issues indeed, and geographers have lost a great deal of the prestige and audience they had half a century ago.

Nothing is lost in the long run. With improved techniques of research and with a greater abundance of data, the geographers could come back to the essential problems of our time ; and these are permanent problems : those of planning and replanning the regions of the earth, of the compartments and the partitions chequering the continents—not only the surveying and description of all these, but also a permanent endeavour better to understand the principles and factors regulating the existing pattern in the organisation of space. To understand the partitioning of the land, of the people and of the minds, is after all the ultimate aim of all political institutions, and the United Nations is facing here—just as the geographers—that problem in its most global and most challenging aspect.

Lecture to the Royal Scottish Geographical Society, March 15, 1950.
[The text has been revised and brought up to date by the author.—Ed.]

[1] UN Document E/620. 1948.

[2] —— The Question of Establishing United Nations Research Laboratories. 1949.

[3] —— E/257. 1947.

[4] —— E/258. 1947.

[5] —— E/620, p. 172. 1947.

[6] —— E/483. 1947.

[7] —— E/649. 1947.

[8] —— E/609, and E/695. 1948.

[9] —— E/1070.

[10] —— E/CART/SR 1-12, E/1322, with three addenda. 1949.

[11] —— Publications, Sales No. 1949, 1, 19.

[12] —— E/1467. 1949.

EDDRACHILLIS PARISH

By Peggie M. Hobson

Edderachilis is a tract of land which lyes upon the northwest coast of Scotland, full of wildernes, mountanes and rockes. Sir Robert Gordon, 1630.

The civil parish of Eddrachillis is situated on the west coast of Sutherland between Assynt and Durness. Together with the present parish of Tongue it was separated from the former vast parish of Durness in 1724. Eddrachillis itself is large, extending for approximately twenty-five miles from north to south—that is, from a few miles south of Cape Wrath to the mountains south of Loch Glencoul. Its longitudinal extent is nearly twenty miles, ranging from Handa Island, off the west coast, to the Reay Forest in the east. The total area of the parish is 135,631 acres. Sheigra, its most northern township, is situated at 58° 30′ N.

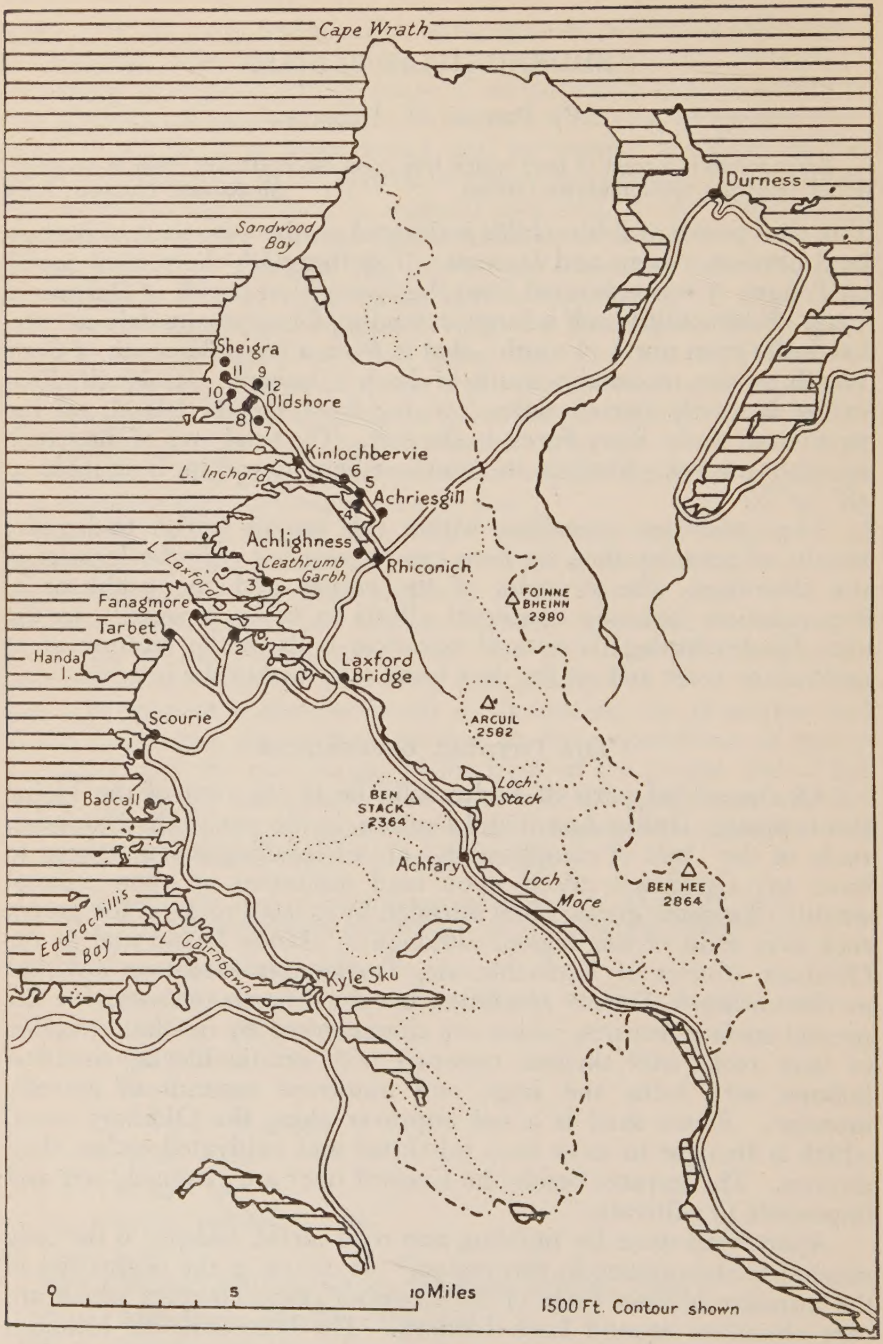
The conditions prevailing within this remote parish to-day are worthy of consideration, for here can be seen not only the legacies of the clearances, the struggles of the crofter and the problems of depopulation, but also concerted efforts to bring prosperity to the area by developing its natural resources both in the crofting areas around the coast and on the deer forest land within the interior.

The Physical Background

All the settled parts of Eddrachillis lie to the west of the Moine thrust plane. Unlike Assynt and Durness, in this parish the Cambrian rocks of the ' belt of complication ' are of insufficient importance to have any significant effects upon land utilisation or upon mineral wealth. Lewisian gneiss, often intruded by igneous rocks, is the parent rock over most of this region, although in Handa Island and in the Oldshore district of Kinlochbervie, Torridonian sandstone outcrops at the surface.[1] Former glaciation has done much to determine the present surface features, which are characterised by desolate stretches of bare rock, wild skylines crowned with erratic blocks, countless hollows with lochs and bogs, and numerous mounds of gravelly moraine. Blown sand is a soil improver along the Oldshore coast, which is thought to have been inhabited and cultivated earlier than the rest. The terraces beside the Laxford river are extremely wet and impossible to cultivate.

Apart from stone for building and road metal, feldspar is the only mineral of importance in this region.[2] It occurs in the pegmatites of the intrusive igneous rocks of the Lewisian gneiss complex which are very abundant around Loch Laxford. The best workable localities exist near Laxford pier, and there is also a smaller but more accessible deposit between Rhiconich and Achriesgill on the Kinlochbervie road.

The scenery of Eddrachillis is wild in the extreme with very few trees to soften its grandeur. The first simple maps of this district prepared by Pont and Gordon in the seventeenth century refer to it



Eddrachillis Parish : Townships.

1. Scouriemore.
2. Foindlemore.
3. Ardmore.
4. Rhuvoult.
5. Insheigra.
6. Badcall-Inchard.
7. Oldshoremore.
8. Pollan.
9. Drumnaguie.
10. Druiman.
11. Balchreik.
12. Blairmore.

as an " extreem wilderness," and they mention also the large number of wolves with which it was infested. The surface relief is exceedingly broken and slopes are steep, even where altitude is not excessive. The Reay Forest is a truly mountainous region and among its numerous peaks are Ben Stack (2364 ft.) and the white quartzite summits of Arcuil (2580 ft.) and of Foinne Bheinn (2980 ft.). These latter mountains have unique relief features : the peaks are flat-topped narrow ridges which are flanked with screes and encircled by corries.[3] This forest, once known as the Dirrie More, has been renowned for centuries for its sport, and according to many old accounts[4] the deer on Arcuil possessed forked tails—a statement which has never been substantiated scientifically. Elsewhere, the parish includes mainly an intensely broken plateau developed on the gneiss, and a limited area of more level moorland on the Torridonian sandstone. There are only two small areas of lowland, one around Scourie Bay, the other along the Laxford river and between Loch More and Loch Stack.

As the eastern boundary corresponds approximately to the watershed, all drainage is towards the west coast. The two principal rivers are the Laxford and Garbh Bhaid, draining respectively into Lochs Laxford and Inchard ; the former is one of Scotland's best salmon rivers. Numerous smaller rivers reach the coast, but in many places the effect of glaciation has been to make drainage indeterminate, and in consequence peaty hollows and countless lochs among the rocks are the dominant feature of the landscape.

The coast is rocky, and is indented by three large inlets penetrating far inland and providing excellent sheltered anchorages—namely, Lochs Inchard, Laxford, Glendhu and Glencoul. Cliffs, especially well developed in the Torridonian sandstone of Handa Island, are frequent. In the Oldshore district there are wide sandy bays, of which Sandwood is the largest and the most beautiful. The grandeur of this bay is completed by its surrounding cliffs and by its offshore islets and stacks ; into it flows the river Sinairidh which drains Loch Sandwood, now a body of fresh water that has been cut off from the sea by the piling up of an enormous storm beach and massive sand dunes. There are numerous small islands, mostly at the mouths of the sea lochs and in Eddrachillis Bay. Handa is the largest of the islands ; its inhabitants were cleared about a century ago, and it is now used only for grazing and as a bird sanctuary.

The climate of Eddrachillis is typical of the north-west coast ; the summers are cool and the winters mild. Rainfall is relatively heavy and falls throughout the year, but although a spring minimum and a late autumn maximum are the rule, the rainfall distribution can be exceedingly irregular. There are significant contrasts between the inland districts and the coast, and especially in the latter areas, the strength and persistence of the westerly gales is the most unpleasant and the most limiting feature of the climate of the parish.

ACHFARY : ANNUAL RAINFALL

Year . .	1941	1942	1943	1944	1945	1946	1947
Inches . .	68·53	81·33	92·68	96·94	79·90	83·95	72·57

EDDRACHILLIS PARISH : TEMPERATURE AND RAINFALL

	SCOURIE		ACHFARY		
	Temp. (°F.)	Rain. (in.)	Rainfall (in.)		
	40 yr. av.	25 yr. av.	Average	1946	1947
January	38·8	4·09	7·28	7·11	4·79
February	38·9	3·37	6·60	11·17	1·74
March	39·5	3·21	6·44	3·92	2·45
April	44·3	2·13	4·85	11·46	10·11
May	48·6	2·03	4·40	1·73	1·52
June	53·2	2·37	3·70	5·14	4·11
July	55·1	3·31	5·35	9·28	3·64
August	55·4	3·51	5·84	8·47	0·28
September	53·0	3·56	5·75	9·88	13·58
October	46·5	5·18	7·80	1·42	6·57
November	42·4	4·71	8·55	7·81	14·46
December	40·4	5·04	9·24	6·56	9·32
YEAR	46·3°	42·51″	75·80″	83·95″	72·57″

SETTLEMENT AND POPULATION

The small, widely separated villages of Scourie and Kinlochbervie are the two main centres of population in the parish. Kinlochbervie is now the more populous, but for many generations Scourie was the home of the Mackays, whose most famous member was General Mackay of Scourie. In 1829 the Reay estates passed into the hands of the Dukes of Sutherland, and under their ownership great progress was made in road construction and in the improvement of transport. However, the first half of the nineteenth century also saw the ill-famed Sutherland clearances which, by forcing the evicted peoples down to the coast to make room for sheep farms, were responsible for the initial settlements in most of the existing crofting townships. The troubled conditions in the Highlands during the latter part of the nineteenth century led to the appointment of the Napier Commission in 1883. In the evidence given for this district both before this commission and before the Royal Commission of 1892 the deep-seated bitterness caused by the clearances can be clearly seen, and it shows also the undoubted arrogance of the then aged factor, Evander McIver.

The passage of the Small Landholders (Scotland) Act in 1886 brought security of tenure and fair rents to the crofters. Although subsequent legislation has brought them much additional assistance, the holdings are inevitably small, and geographical considerations make them difficult to work. The Crofters Commission, set up by the Act of 1886, did much useful work in embodying grazing regulations, in granting enlargements to common grazings, in stating exact soumings, and in attempting to deal with the problem of the landless cottar. In 1892 there were 101 crofters and 43 cottars in the Kinlochbervie district.[5] This work was continued by the Scottish Land Court, whose first task in this region was the breaking up of Sheigra farm in 1912 to provide holdings for cottars. At that time, Sheigra and Sandwood were both small farms which had been formed by clearing earlier small-holders after the potato famine of 1846. Assist-

ance was also received from the Congested Districts Board for the provision of boatslips, roads and footpaths, and for telegraphic extensions.

Much of Eddrachillis has always been deer forest land, and from 1840 onwards its extent increased at the expense of some of the sheep farms. The acquisition of the Reay Forest by the Duke of Westminster in 1871 provided much employment, as he improved the roads, built numerous paths and enlarged the lodges. In 1892 Eddrachillis parish was divided up as follows :—

	ACRES	RENTAL
Sheep farms . .	27,551	£ 371
Forests . . .	77,800	1,380
Crofts . . .	30,200	607
	135,551	£2,358

The farms were situated at Duart Beg, Scourie, Sandwood, Sheigra, Skerricha, Rhimichie, Rhiconich, Handa and a part of Keoldale farm. Glendhu Forest had also previously been let as a sheep farm.

At present the parish contains four estates : the Reay Forest estate, a very large and exceedingly well maintained sporting estate, the Kinlochbervie estate, the Scourie estate—a part of the formerly much more extensive Sutherland estates, and Ceathramh Garbh, a smaller estate between Lochs Laxford and Inchard. The Reay Forest is mostly deer forest land ; however, it carries some sheep, cattle and ponies, it supports small home farms at Achfary and Kylestrome, and afforestation work is now proceeding on it in sheltered situations near Loch More. The other estates contain small crofting townships with much common grazing land, sheep farms at Duartbeg, Scouriebeg and Rhimichie, and small village centres and angling headquarters at Kinlochbervie and at Scourie.

The parishes of the north-west mainland are the most sparsely populated in Great Britain, and depopulation has been both rapid and continuous here for over a century. Sparseness of population and remoteness together have their own inherent problems : the provision of educational and professional services, of transport facilities and of public utilities becomes uneconomic and difficult to administer. Again, economic developments and the social life of the communities are greatly influenced by the age groups of the population. In Eddrachillis the proportion of elderly people is high : there is insufficient employment to support younger people with growing families, who must inevitably seek work elsewhere. At the present time there are considerable differences in the two ends of the parish. Scourie continues to decline in population, especially in young people—the number of school children has dropped from 40 in 1945 to 19 in 1950, but in Kinlochbervie, where the fishing industry has brought a considerable amount of employment, the number of younger people settling in the area has actually increased within the last few years, and labour is now (1950) quite scarce there.

In 1931 and in 1946 the population was distributed as follows :

EDDRACHILLIS PARISH	1931			1946		
	OVER 14 YEARS	UNDER 14 YEARS	TOTAL	OVER 14 YEARS	UNDER 14 YEARS	TOTAL
Crofting townships . .	647	198	845	557	131	688
Other areas .	96	17	113	65	16	81
Totals .	743	215	958*	622	147	769

* This figure includes permanent residents only, and therefore differs slightly from the census return.

The crofting townships are all coastal in location, and it is only in Scourie and at Kinlochbervie that there is any continuous settlement. Elsewhere the townships are all small and very isolated. Tarbet had no road until 1938 ; Ardmore is still without one. The non-crofting settlements at Achfary and Kylestrome are inhabited by estate workers on the Reay Forest, and there are also isolated shepherds' and keepers' houses, some of which are exceedingly remote. Particulars of the crofting townships of Eddrachillis are given below :

Crofting Townships of Eddrachillis Parish

ESTATE	TOWNSHIP	NUMBER OF HOLDINGS	TOTAL POPULATION IN 1946
Scourie—	Badcall, Scourie . .	11	33
	Scouriemore . .	25	66
	Scourie village . .	10	71
	Tarbet . . .	5	22
	Fanagmore . . .	2	15
	Foindlemore . .	6	31
Kinlochbervie—	Achriesgill . . .	16	74
	Badcall-Inchard . .	5	28
	Balchreik . . .	8	31
	Blairmore . . .	8	38
	Drumnaguie . .	6	28
	Druiman . . .	5	19
	Insheigra . . .	1	5
	Kinlochbervie . .	12	61
	Oldshoremore . .	13	50
	Pollan	4	22
	Rhuvoult . . .	4	9
	Sheigra . . .	7	16
Ceathramh Garbh—	Ardmore . . .	5	29
	Portlevorchy . .	1	
	Ardbeg . . .	1	
	Achlighness and Rhimichie . . .	7	40
	Total . . .	162	688

Population of Eddrachillis Parish

SOURCE OF INFORMATION	DATE	POPULATION
Webster's census	1755	869
Old Statistical Account	1791	1024
Census returns	1801	1253
" "	1811	1147
" "	1821	1229
" "	1831	1965
" "	1841	1699
" "	1851	1576
" "	1861	1641
" "	1871	1530
" "	1881	1525
" "	1891	1409
" "	1901	1418
" "	1911	1245
" "	1921	1131
" "	1931	967
Estimate	1946	769
West Highland Survey Estimate	1948	761

Land Utilisation

Arable land in Eddrachillis is exceedingly limited, yet, although so much of the area is wild, rocky and mountainous, there is a surprisingly large amount of good summer grazing land. In pre-clearance days this parish supported a fair number of black cattle which were driven to the sheilings in the summer. With the development of sheep farming, however, the number of cattle declined and the distribution of the population was radically altered. The land-use pattern has changed very little during the present century : there is deer forest land which now also supports some sheep and cattle, there are the crofting townships with their common grazing land, and there are rented sheep farms which are small compared with those of Assynt and Durness. In addition, parts of the deer forest land are sometimes rented out for grazing purposes.

Woodland.—The woodland areas are mainly small and scattered, occurring at the foot of Ben Stack, along Loch More and at Duartmore and Scourie. In all probability the woodland areas were once much more extensive, and it is certain that many areas could support more trees. Bearing this in mind and having a real desire to provide employment for the people of the district, the proprietor of the Reay Forest estate has recently embarked upon a large and comprehensive afforestation scheme. Initial drainage operations, employing over fifty local men, have been proceeding during the winter of 1949-50 along the south side of Loch More, and it is hoped that the first trees will be planted here in the autumn of 1950. If successful, it is hoped to extend the scheme and thus provide not only timber and improved natural drainage but also very valuable shelter for grazing animals.

Crofting.—The twenty townships of Eddrachillis contain 162 small holdings with a total population of 688. The emptiness of the north-western mainland is at once apparent when compared with the Outer Hebrides, where the townships are larger and the population

density much greater.[6] The division of an Eddrachillis township into its holdings can be seen by taking Scourie village as an example.

Scourie Holdings

HOLDING	ARABLE A. R. P.	OUTRUN A. R. P.	RENT £ s. d.	COMMON GRAZING	SOUMING
1.	2 2 21	— 1 —	8 0 0		
2.	4 — 8	— 1 27	4 15 0		
3.	3 — 3	— 1 9	5 16 8		1 cow and 6 sheep
4.	2 2 5	1 3 38	5 12 0	$\frac{1}{41}$ share	per pound ster-
5.	2 3 24	— 1 29	5 0 0	of	ling of rent.
6.	2 3 4	— 1 8	5 0 0	6500	1 horse to 8 sheep.
7.	2 2 35	— 1 12	5 0 0	acres	1 cow to 5 sheep.
8.	3 3 20	2 1 12	5 18 0		1 cattle beast or
9.	2 1 31	1 3 13	3 17 0		colt to 3 sheep.
10.	3 1 21	— 3 —	6 0 0		

The work on the individual holdings and the communal activities of the townships are organised in much the same way as in the neighbouring parishes.[7, 8] The arable acreage is very small, and, although much of the land is steep and rocky, tractors are quite widely used ; the demand for horses is declining. Horses were reared for sale here at one time and bought by dealers who sold them in Orkney. The crops grown are hay, oats, and a very few turnips to provide feeding stuffs for animals ; the potato is the main crop grown for human consumption. Cheviot sheep are the main source of cash income, and most townships have an abundance of good summer grazing land. The lack of arable land and of adequate enclosures means that the ewe hoggs must be wintered on the crofts, and also that the ewes must be brought down from the hills for the lambing. This delays cultivation and cropping, and necessitates undesirably late harvests. In this parish there are no club sheep stocks, all the flocks being individually owned. The township of Achriesgill manages its sheep as if it were a hirsel of a large sheep farm ; the lambs are all sold in Lairg and often fetch among the highest prices in the county.

The cattle kept on the crofts are mainly Aberdeen Angus, or Aberdeen Angus crossed with Shorthorn. Bulls are usually supplied by the Department of Agriculture, and the calves are sold in Dingwall at a very early age. Since August 1949 all the cattle in the Scourie area have been attested : this is not a widespread practice in crofting districts. The difficulty of providing winter feeding stuffs restricts the increase of the all-year-round cattle population, but in 1949 the Scourie crofters bought in some Ayrshire heifers and summered them successfully on the hill grazing.

Eggs and poultry are sold outside the district by individuals ; a more closely integrated industry would doubtless be more remunerative than the prevailing system. Some crofters also fatten pigs, but only on a very small scale.

Sheep Farms.—The rented farms in Eddrachillis are all hill-sheep farms with a little arable land for growing feeding stuffs. Scouriebeg, the largest of these farms, has a total acreage of 5000 and carries a stock of about 900 Cheviot sheep. The farm is worked by three men, but the 40 acres of arable land are cultivated by using a Department of Agriculture tractor. The sheep farmers must send their ewe hoggs away for wintering, a practice which is now becoming exceedingly costly.

EDDRACHILLIS : AGRICULTURAL STATISTICS

	1938	1945	1949
LIVESTOCK (numbers)—			
Dairy Cattle	372	396	371
Beef Cattle	31	40	71
Horses	92	76	81
Sheep	10,091	19,373	19,224
Pigs	9	2	6
Poultry	2,206	3,637	5,183
CROPS (acres)—			
Barley	5	—	5
Oats	161	103	106
Potatoes	94	59	64
Turnips	21	8	12
Rotation Grasses	120	137	119
Permanent Grasses	343	547	486

SPORT

As it is non-productive agriculturally, land which is reserved for sport has a high rateable value and is thus a valuable source of revenue to the County exchequer ; and, moreover, although it can support only a very sparse population, the employees obtain a fixed wage and a good house and are spared the economic uncertainties which are the crofters' lot.

The Reay Forest Estate, extending to approximately 100,000 acres, can have few equals in Scotland for the excellence of its sport. Although the deer forest now carries some stock, it is still practically exclusively sporting land and the estate employs about fifty men. The sporting rights on the other estates are either retained by the proprietors or are let to tenants. Until recently, gillying in summer time provided a very valuable source of part-time employment for the crofters, some of them working at a considerable distance from their homes. The visiting sportsman still provides useful supplementary employment in both ends of the parish—a gillie earns approximately 16s. per day—especially in the Scourie area, where there is no fishing industry and where fewer people are employed in forestry and road works than in Kinlochbervie.

TOURIST TRADE

The development of the tourist trade in such remote and sparsely

populated areas is seriously handicapped by the inadequacy of transport facilities. Mail buses run daily from Scourie and Kinlochbervie to Lairg and back, but there is no organised transport between the villages of Scourie, Kinlochbervie and Durness, and no means of travelling to Assynt via the Kylesku ferry. This district is, however, becoming increasingly popular with motorists, cyclists and hikers, but the available accommodation is limited and only a few of the crofters' houses have either the space or the facilities for offering accommodation to visitors.

Industry

Apart from primary industries such as fishing and kelp burning, industrial activity has never been of any importance in this parish and it remains insignificant to-day. Even hand industries have never been developed on any appreciable scale in spite of the efforts of the Sutherland estates in the nineteenth century, when first an Industrial Society and later the Sutherland Home Industries were established. There has been much discussion recently concerning the erection of a whaling station at Weavers Bay, Loch Laxford ; this would undoubtedly provide some seasonal employment, but objections to the scheme have been lodged which necessitate an enquiry into the matter by the Secretary of State for Scotland. The landing of fish at Loch Clash within the last few years has brought considerable prosperity to Kinlochbervie, and has necessitated the improvement of the road linking the village with the main road at Rhiconich.

Fishing

In spite of the proximity to the rich fishing grounds of the Minch, the development of commercial fisheries in Eddrachillis will always be hindered by the distance from markets and by a lack of suitable ports. Fish was once a much more important article of diet than it is to-day; all of it was caught locally, some of it being cured or salted for winter use. As in the neighbouring parishes, some of the people went away to do seasonal work from the east-coast fishing ports. At different times varied commercial fishing enterprises have been pursued along this coast ; most of them have been on a small scale.[9]

Salmon netting was once carried on at Badcall, Scourie. The original promoters built a large store house with a workshop, an ice store, etc., a house for the manager and a small boatslip. They owned a sailing vessel for transporting the salmon to Stornoway, Strome Ferry and, later, to Kyle of Lochalsh. The entire concern was taken over by the proprietor of the Reay Forest estate at the time of the first world war ; no salmon netting has been carried out since that time, and the Badcall premises are now becoming derelict.

Herring fishing.—With the exception of the very successful winter of 1926-27 there has been no herring fishing worthy of note in Eddrachillis during the present century. The very heavy fishing of 1926-27 lasted from November, 1926, until February, 1927 ; east-coast drifters, Stornoway drifters and small local boats were all engaged in it. During the first month Lochs Inchard and Glendhu were fished as

CROFTS AT TARBET, SCOURIE

ARCUIL AND BEN STACK

Foreground : Lewisian Gneiss. Background : Cambrian outcrop

LOCH NA CLAISE—KINLOCHBERVIE AND PIER
LOCH INNIS NA BA BUIDHE—FREE CHURCH (R)
LOCH INCHARD

well as Laxford, but after that fishing was confined to Laxford, the main fishing ground being between Foindle and Fanagmore. All the fish were klondiked and taken to Germany, mainly by large German trawlers. Prices ranged from 10s. to 15s. per cran. In 1927-28 the herring shoals reappeared in Loch Laxford for a few weeks ; local boats again did well, some making as much as £100 per night.

Total Landings by all Boats at Lochs Laxford, Inchard, and Glendhu

SEASON	CWTS.	£	CARGOES SHIPPED TO ALTONA, GERMANY
1926–27	65,552	41,425	105
1927–28	23,214	40,198	41

Since 1948 some herrings have been landed at Loch Clash, mainly by Stornoway boats when fishing the Handa Island grounds. The herring are mostly cured into barrels or sent to Wick and Fraserburgh for kippering. With the contraction of markets, there is very little hope that Loch Clash (Loch na Claise) can develop as a herring-landing centre.

Herrings Landed at Loch Clash

YEAR	CWTS.	£
1948	4703	4032
1949	2828	2541
1950 January to April	3020	3848
1950 April to July	1480	1950

Whitefish.—Seine netting was first tried in the North Minch in 1948 by some Moray Firth boats, owing to scarcity of fish in their own waters ; Loch Clash, being very close to the fishing grounds, gradually established itself as a landing centre. The Flat Rate Transport Scheme was in operation, and as the fish was of high quality, maximum prices were usually obtained. Fishing continued throughout the year with an average fleet of between twelve and fifteen boats : February to March (for cod) and the summer months (for hake and haddock) were the busiest times. In April, 1950, the price of whitefish was decontrolled, with the result that most of the boats returned to the east coast, where they obtained high prices for their fish. Transport costs make it virtually impossible for the small and remote port of Kinlochbervie to compete with the large, accessible and well-established ports of the east, and it seems unlikely that it can regain its growing status of the last few years.

Whitefish Landed at Loch Clash

YEAR	CWTS.	£
1948	13,348	31,253
1949	27,261	63,056
1950 January to April	6,387	13,295
1950 April to August	2,027	4,793

Lobster fishing is the main fishing among the crofter-fishing communities of the north-west coast, and as the main season is from October until April, it is a most valuable source of part-time employ-

ment. There is a high mortality rate in summer, and it is therefore not an economic proposition to send lobsters to Billingsgate at that time of year. The average price obtained is between 2s. 6d. and 3s. per lb., but although this is quite high, transport rates and the cost of gear are now so excessive that, when fishing time lost by bad weather is also considered, it is doubtful if the nett value of lobster fishing is increasing for the fisherman. A site for a lobster storage pond—such as those now in use in Bernera, Lewis, and in Stockinish, Harris—was surveyed two years ago, but the project has not yet been developed. Such a pond would be of great benefit to the fishermen, enabling them to prosecute the fishing throughout the year. In Eddrachillis, lobster fishing is best developed at Tarbet, Scourie, a small township opposite Handa Island.

Lobster Landings and Prices

YEAR	CAPE WRATH TO LAXFORD		LAXFORD TO BADCALL		BADCALL TO DRUMBEG	
	NUMBER	VALUE	NUMBER	VALUE	NUMBER	VALUE
1926	6,300	£ 510	9,528	£ 667	12,547	£ 888
1927	7,634	474	9,055	565	8,151	510
1931	8,537	487	12,417	704	13,051	739
1932	10,226	629	8,579	517	9,993	669
1947	18,190	3,348	5,784	1,094	3,520	902
1948	9,040	1,683	10,312	2,048	4,100	1,040
1949	6,925	1,236	9,473	2,165	4,300	1,127

Conclusion

Eddrachillis has much in common with both Assynt and Durness. All are large, mountainous, isolated and inevitably sparsely populated parishes, and their problems are as much geographical as they are historical. The inevitably small scale of any enterprises for improvements and developments in such remote regions tends to condemn them as uneconomic from the start and to rule out competition as impossible. Few landowners can now finance major developments on their estates, and with the more even distribution of the nation's wealth which now prevails, it seems that either all developments must be government-controlled and/or financed, or else that some revision of the legislation concerning small-holders and small holdings must be made which will enable those who wish to settle in these districts to bear more responsibilities for their own welfare and progress and thus to achieve a higher degree of independence than now prevails.

The author wishes to acknowledge her thanks to the following for their kindness, assistance and co-operation in the preparation of this paper: Mr. T. Adam, Factor, Golspie ; Mr. A. C. Neish, County Planning Officer, Dornoch ; Mr. T. P. Burnett, Fishery Officer, Ullapool ; Colonel Neilson, Kinlochbervie ; Dr. MacLaren, Scourie ; Mr. Matthew Elliott, Achfary ; Mr. D. A. Macleod, Tarbet, Scourie ; Officers of the Department of Agriculture for Scotland, the Scottish Land Court, the New Register House and the Meteorological Office ; Residents in Eddrachillis ; Mr. W. Mills, Department of Geography, The University, St. Andrews.

Photograph of crofts by the author. Other photographs by permission: Crown Copyright reserved.

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THE FLOODS OF 12TH AUGUST, 1948, IN SOUTH-EAST SCOTLAND

By A. T. A. Learmonth

On 12th August, 1948, there was exceptionally heavy rainfall over south-east Scotland and north-east England. Very severe flooding occurred, especially in East Lothian, Berwickshire, and Northumberland, in a wide area roughly within the 3-in. isohyetal. The damage, notably that to the railway, was costly, and much suffering was caused, though fortunately there was no direct loss of life. Various measures were promptly taken, but a general survey was still lacking a year later, by which time much of the evidence had been effaced. During six weeks in the field, mainly in the basins of the Tyne, Eye, and Whiteadder, during the summer of 1949, the author attempted to glean from the altered scene and from the year-old memories of eye-witnesses, and from other sources, data for scientific record.[1]

On August 7th-8th there was heavy rain, in some parts up to 4 in., followed by humid days with some rain. On August 11th the rainfall ranged from 0·5 in. in the north of the area to 1 in. in the south, and the soil was saturated when, on the following day, a maximum of 6 in. fell on the Tweed, and part of the Merse had over 5 in. There was also a secondary maximum of over 5 in. on the hills between Tyne and Whiteadder. The intensity of rainfall on that day was considerable, for instance 1·9 in. during two hours were recorded at Swinton House near Duns. In the Lammermuirs, witnesses described " sheet-wash " up to 3 in. deep on slopes of from under 5° to 30°. From this and from calculations of run-off, the writer believes that areas of intense rainfall may have been under-estimated.

Douglas [2] has described what is known of the causes of the abnormal rainfall, and concludes that the particular combination of circumstances is unlikely to recur. On 29th September, 1846, however, bridges near the Eye were destroyed or damaged, and there were

comparable landslides and damming of water behind the railway embankment. When exceptionally heavy rainfall does occur, it would appear that the landforms, land-use, and man-made constructions tend to make the area peculiarly vulnerable.

The Lammermuir Hills show two erosion surfaces, one at about 1500 ft., and the lower at 500-750 ft., slightly tilted S and E. Owing to the scarp face in the north, the northward flowing streams are steep in their upper reaches, but flatten out to a gentle slope, to about 1 : 370 in the case of the middle Tyne. The streams flowing southward are somewhat longer, and only a short part of their upper reaches is youthful ; the lower reaches are relatively steeper than that of the middle Tyne : near Chirnside, the Whiteadder slopes at about 1 : 200. When a valley passes from the Old Red Sandstone to the stronger Silurian rocks, as that of the Whiteadder and Monynut, the bed of the stream narrows and becomes steeper, as does that of the Tyne and some of its tributaries when passing through igneous rocks.

Most of the present vegetation of the Lammermuirs is heather and grass, used for rough grazing. Where there is arable land, the prevalent practice of ploughing up- and down-hill promotes the loss of soil.

The behaviour of streams was inevitably violent, but it was important that their banks and beds had, for economic reasons, become neglected. The siting of buildings greatly affected the extent of the damage wrought. Thus hills and small farms—often originally mills—on the outside of a river bend were more vulnerable than those on the inside. Compare, for instance, the badly damaged Cumledge Mill on the Whiteadder, with the farm at Cockburn Mill upstream.

By erosion, transport, and deposition much damage was done to houses and industrial buildings, and to their contents ; many fields were inundated ; there was considerable loss of live-stock, and valuable fields were strewn with thick deposits of gravel. Places notably affected by flooding were some along the northern hill-foot, low-lying areas of Haddington, and the Tyne-Biel delta west of Dunbar, where the flood waters met the high tide. The Eye and the Whiteadder were responsible for a scattered incidence of flooding, whereas the Blackadder attacked the fairly extensive lower part of the village of Greenlaw.

The outstanding feature was the extraordinary damage effected by the small Eye Water, which destroyed seven main-line railway bridges and several road bridges as well as a tall pillar of the railway viaduct near Eyemouth. This little stream has an elongated basin of about only 13·6 square miles upstream from the railway bridges, but uprooted riverside trees dammed temporary lakes until the underscour of the foundations caused the collapse of the bridge and further havoc downstream. The first bridge across the Eye, at Pait's Hill, could not cope with the run-off, and a temporary lake of about 5 acres was ponded back, although here timber was not responsible. Shortly thereafter, another small bridge was broken at Blackburn Mill, also influencing events lower down. Timber caused the destruction of the last bridge across the Whiteadder before it joins the Tweed ; the Whiteadder wrecked bridges from within two miles of its source. The Tyne destroyed only one important bridge, also several footbridges, but its

right bank tributaries from the steep northern face of the Lammermuirs wrought much destruction, including nine bridges. The bridges spared usually stand high above the water, and the approaches are on the flood plain over which the flood waters can be dispersed. Substantial bridges across the Blackadder were destroyed, because they were built at natural or artificial constrictions which impeded the escape of the flood waters.

About thirty per cent. of some two hundred cases of relatively minor damage to roads occurred at the northern hill-foot, and another thirty per cent. in the East Lothian lowlands.

Deposits of gravel on the haughs caused heavy losses to farmers ; debris amounting to several thousand tons on a single haugh of a few score acres was common. The contrast between the north-flowing and south-flowing streams was again marked. The gorge of the Whiteadder near Abbey St. Bathans formed a zone of erosion, not of deposition.

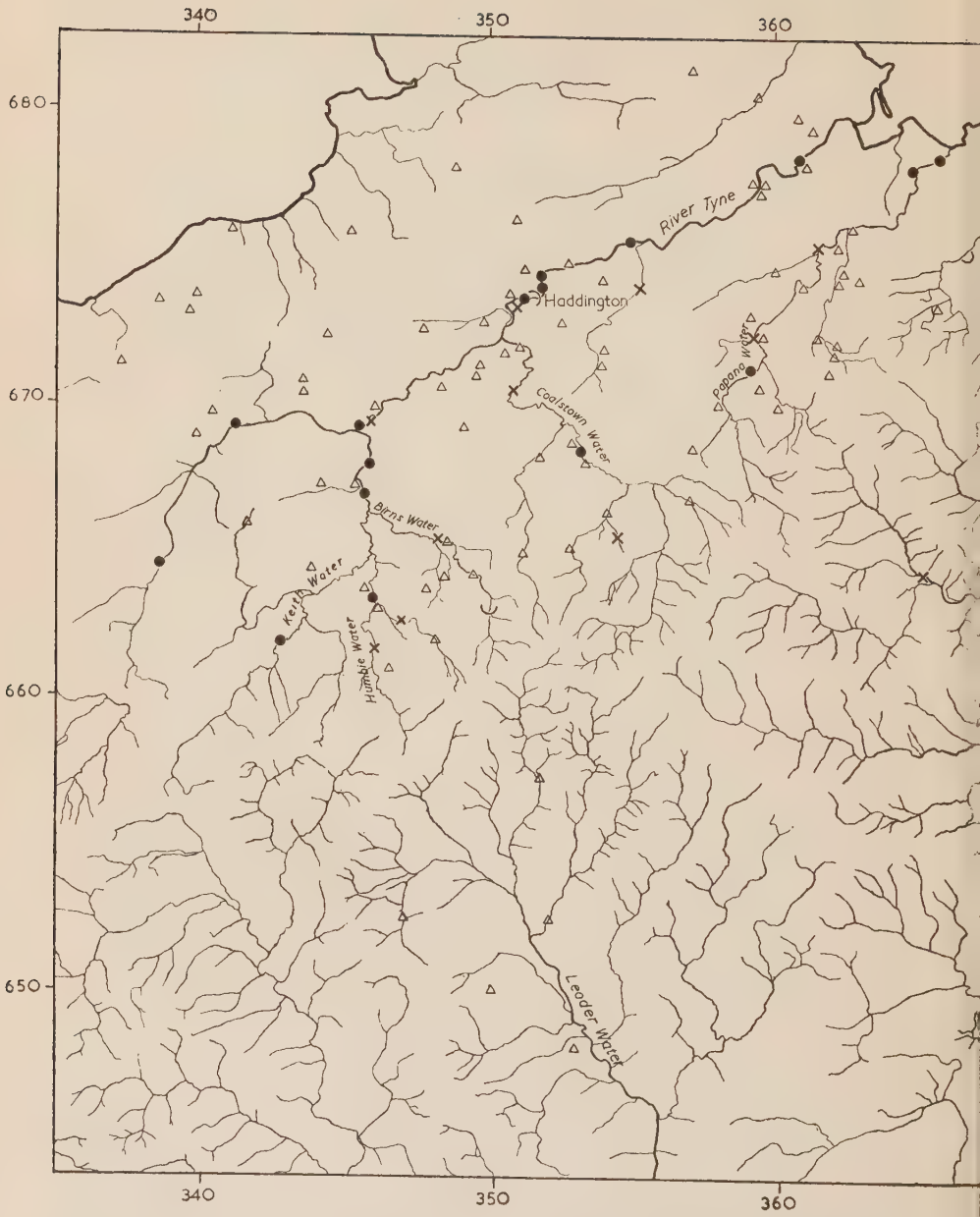
A few major landslides which blocked communications received some publicity at the time, but there were also several hundred small landslides. They were most common on slopes over about 1 : 3. There were relatively few landslides in woodland, but when they did occur, a deeper and more extensive scar remains. Gullies in many parts of the Lammermuirs added to their cone of debris, so impeding roads and changing the course of streams, and a few fresh gullies were formed by scouring in ditches.

Very few farmers regarded the loss of soil by erosion or by leaching as very serious. But on the days following the flood the sea was stained red with the Old Red Sandstone soils for two miles out. Research is needed to determine whether the great loss of soil was, in a sense, normal to an exceptional rainstorm, or whether it was a symptom of continuous accelerated erosion.

Quantitative estimates show that, over a wide area, run-off was as high in proportion to the size of catchment areas as any recorded in Britain. It was increased and, especially, the flood peak was reached earlier, where slopes are steep, and also in areas affected by the herring-bone system of hill drainage. The 1948 flood apart, it may be a matter of national importance that recent hill drainage schemes are causing violent and flashy spates in many and widespread areas.

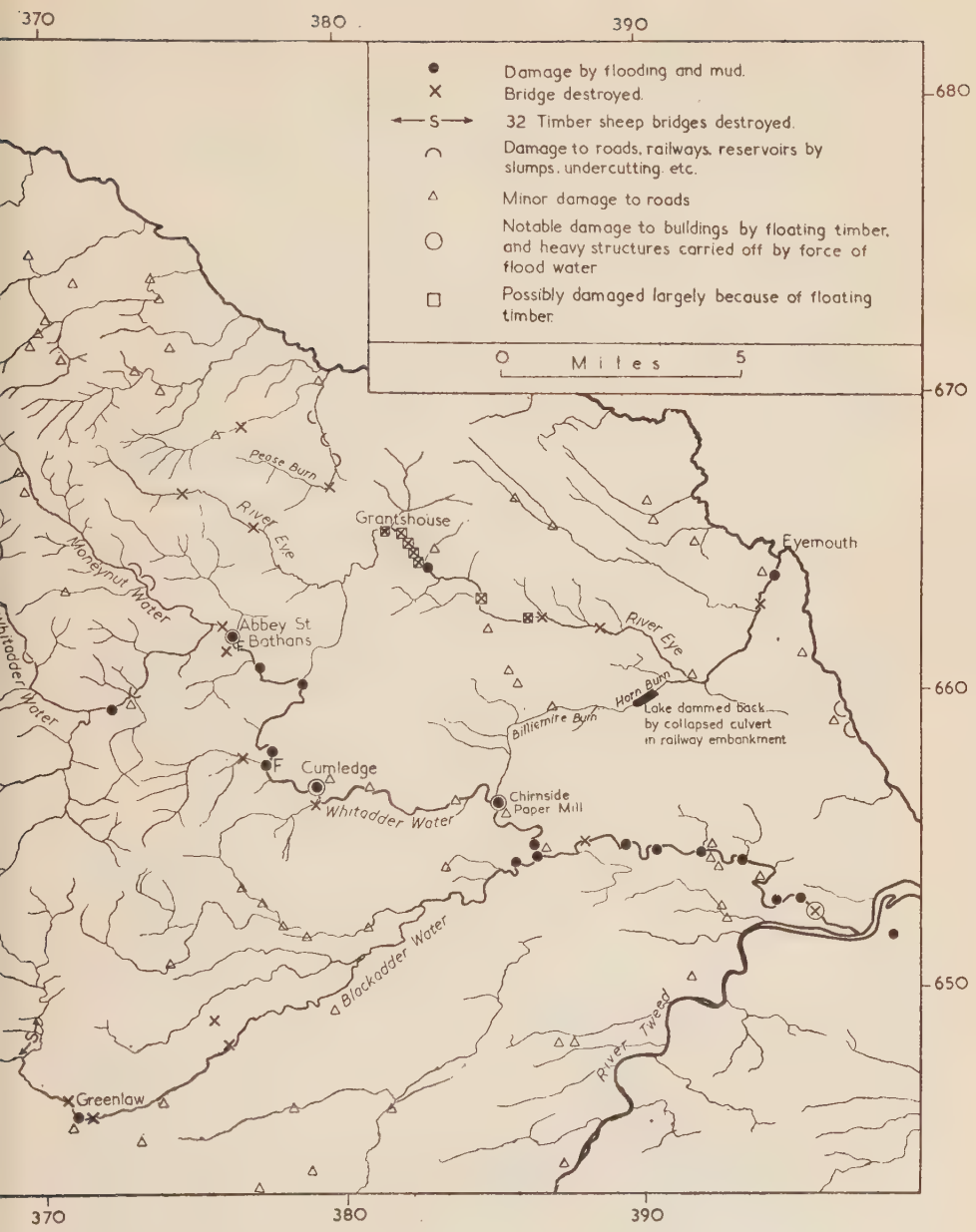
Run-off was slowed down, on the other hand, by peat deposits and also by woodland. Removal of trees during the last twenty years has not been sufficient to constitute a major factor in this flood however. Records of the effect of afforestation on run-off in the Vyrnwy catchment area, in the Emmental in Switzerland, and in the Tennessee Valley suggest that had the Lammermuirs been under forest, differences in run-off and in flood peaks would have been slight but beneficial. Floating timber was not generally derived from the woods on the uplands, nor from wooded river bluffs, but from woodlands planted on the flood plains, from parklands on the haughs, and especially from self-seeded alders, willows, and other trees on the banks.

Excellent work was done in dealing with a crisis of national as well as of local importance. The seven main-line railway bridges were replaced by temporary bridges within about two months after the



South East Scotland. Rivers, and damag

Based upon the Ordnance Survey Map, with th



sed by the floods in August, 1948.

ction of the Controller of H.M. Stationery Office.

flood, though the lake containing some 100 million gallons of water, and dammed by a blocked culvert in the railway embankment near Ayton, presented a serious problem for many months. Measures to control the future behaviour of the Eye Water were taken in hand by the drainage engineers of the Department of Agriculture. Action to replace the road bridges has been much slower, but this may, it is hoped, be of advantage in allowing a more careful estimate to be made of individual local conditions before permanent bridges and other structures are built.

The work of clearing thousands of cubic yards of gravel and other debris from the haughs is worthy of the high praise received from farmers and others. Flood-banks have been formed with the aid of bulldozers, and then sown with grass seed. Though the banks were made by the most economical, effective, and speedy methods available, it appeared to the writer that the banking was done rather uniformly, irrespective of the slope, the curve of the stream, the nature of the debris, or the prospects of the grass taking root. The best of the banks, especially where the grass cover became established, are in good shape, but many others have already been all but destroyed by minor spates. Clearly, the continual maintenance required is beyond what can be expected of the modern riparian landowner. Reference to comparable work in New England suggests that earth or gravel banks should be used in conjunction with masonry revetments at sharp bends and in the lower parts of the banks which are subject to frequent attack by minor floods. Pliable young tree growth, bending under the weight of flood waters and so forming a protective mat, have also proved useful allies. The value of trees on the stream banks depends upon the proper choice of species, density of spacing, and treatment—for example, pollarding and coppicing, instead of encouraging tall old standards.

Unfortunately, the funds made available could only be applied to alteration of the channels if there was obvious damage due to the floods of August, 1948. Improvements considered necessary by the engineers could not be made unless and until a general scheme is prepared. The consequences of piecemeal work can be imagined. For instance, while the constricting gorge at Abbey St. Bathans has not been altered, a quicker run-off has been contrived upstream. Again, the channel of the Tyne has been only locally improved below Haddington, whereas upstream the bed and banks of the important tributaries have been extensively altered.

In view of evident gaps in knowledge of the area, and of the long-term trends involved in the catastrophic events discussed, the writer would plead for work on local climates, with more numerous weather stations than are normally contemplated by the Meteorological Office ; for more recording of the behaviour of rivers and streams ; for more experimental work on problems of the relation of soil erosion and tree cover, initially on slopes of over 1 : 3 ; for more co-operative research—the work of the TVA has shown the value of such team-work ; and, after a flood, for prompt aerial survey and broadcast appeals for observations of river behaviour, etc.

After the deluge remedial measures were taken, but they have been piecemeal, without a general, integrated plan. Recent changes, too, have brought about a real loss of amenity. This difficulty can doubtless be overcome, but the successors to the eighteenth-century Improvers have yet to be found.

The author acknowledges gratefully the help received by a pecuniary grant from the Carnegie Trust for the Universities of Scotland, as a contribution to the expense of the field work of his investigation.

[1] The full report, under the same title, is too voluminous for publication here. In view of the detailed and valuable observations recorded by the author, and in order to preserve a record in these pages, the foregoing abstract is published with his consent.

The various phenomena were put on record as far as possible in the form of maps, diagrams and tables. One hundred copies of the original typescript have been prepared, and may be obtained at cost price from : A. T. A. Learmonth, Department of Geography, University of Liverpool, 12 Abercromby Square, Liverpool 7. [Ed.]

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THE ALUMINIUM INDUSTRY IN SCOTLAND

By L. V. Chilton

Aluminium was practically unknown as an article of commerce until about sixty years ago ; yet to-day, in terms of volume, it stands next to iron and steel in the list of metals in everyday use, as shown in the following Table :

World Production of the Commoner Metals, 1948

	Thousands of long tons	*Relative to Aluminium=100*	
		By weight	*By volume*
Steel (ingots and castings)	165,865	13,330	4,620
Copper (crude primary)	1,896	152	48
Zinc (primary)	1,618	130	49
Lead (smelter)	1,256	101	24
Tin (ore-content)	153	12	4
Aluminium (virgin ingot)	1,245	100	100

The Scottish industry had its beginnings in 1894, and Scotland thus ranks as one of the first countries to produce the metal. Progress since the middle 'nineties has been continuous, with the result that Scotland possesses to-day an integrated aluminium industry ranging from ore-treatment to the production of virgin aluminium ingot and semi-fabricated forms of the metal and its alloys, all under the ownership and control of The British Aluminium Company Limited. In addition, there is now a number of independent concerns producing finished goods of the most diverse types.

Technical Aspects of the Production of Virgin Aluminium

Before analysing the growth of the Scottish aluminium industry or surveying its present extent, we must refer briefly to some of the technical aspects of the production of aluminium from its ores.

Aluminium is the most abundant metal in the earth's crust, of

which it forms some 8 per cent., and as such it comes next in abundance to the non-metals oxygen and silicon. It is not found native, its commonest mode of occurrence being in the form of complex alumino-silicates such as the felspars and micas, which are essential constituents of many rocks, and of their weathering products including the clays. None of these widely distributed materials, however, can as yet be used as the basis of an economic process for aluminium production : such a process requires still more highly weathered products—bauxites and laterites, in which the aluminium is present simply as its oxide (alumina), hydrated in greater or less degree. Such ores are of wide-spread occurrence in tropical regions and in various parts of the northern temperate zone. They contain, in addition to alumina and varying amounts of free and combined water, impurities such as iron oxides, silica, and titania.

Two factors distinguish the winning of aluminium from its ores from that of the majority of other metals, and both stem from the great stability of its oxide. In the first place, the chemical reducing agents (coke and the like) commonly used in the metallurgical industries are incapable of reducing alumina to metallic aluminium ; and secondly, aluminium itself is so readily re-oxidised at high temperatures that the repeated resmelting and refining treatments commonly applied to other metals have to be kept to a minimum. This means in practice that, to produce pure aluminium, we must first prepare a very pure alumina from the ore and must then reduce this alumina to the metal by the only alternative process to chemical reduction, namely, electrolysis.

The first stage—production of pure alumina from bauxite—is most usually effected by the Bayer process. In this process the bauxite is ground and then digested in a strong solution of caustic soda, which dissolves out the alumina and incidentally much of the silica, leaving the iron and titanium oxides in suspension. After digestion, the liquor is diluted slightly to assist separation of the dissolved silica as an insoluble aluminosilicate, and is then separated from all the suspended solids by passing through ' thickeners ' and ultimately by filtration. The clear liquor, which contains alumina in solution, passes to large tanks in which, under the ' seeding ' action of added hydrate of alumina, the bulk of its dissolved alumina crystallises out in a hydrated form. This, after washing, is finally calcined in rotary furnaces at a temperature of 1200° C. to remove its combined water and yield the pure oxide.

Typical Analyses

	Gold Coast Bauxite per cent.	*Calcined Alumina per cent.*
Al_2O_3	58·0	99·55
SiO_2	2·0	·03
Fe_2O_3	11·5	·02
TiO_2	1·8	—
Na_2O	—	·30
Loss on ignition	26·7	·10
	100·0	100·00

We are not concerned here with further technicalities of the Bayer process, except to note that careful conservation of the caustic soda in a closed cyclic process is a matter of great economic importance, that a great deal of fuel is needed to raise steam for concentrating the recycled soda solution, and that considerable quantities of the insoluble sludge—or 'red mud'—result as a trade-waste having some by-product value.

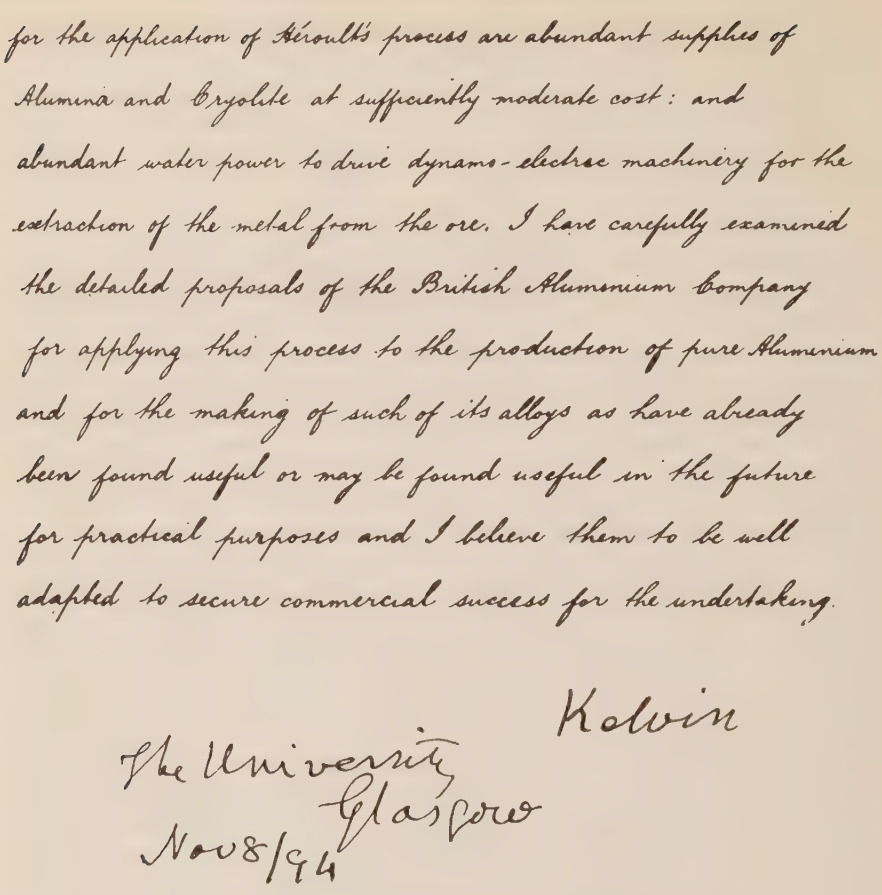
In the electrolytic reduction process discovered simultaneously and independently in France and the U.S.A., in 1886, by Héroult and by Hall respectively, pure alumina is dissolved in molten cryolite at temperatures approaching 1000° C., and a direct current of electricity is passed through the melt. The alumina is decomposed to its constituents, oxygen and aluminium, the former being released at the carbon anode (which consequently burns away) and the latter separating in molten condition on the carbon-lined floor of the reduction furnace, arranged as cathode, from which it is drawn off from time to time. For some thirty years prior to the introduction of this process, aluminium had been commercially produced on a minute scale by Deville's method of reducing molten aluminium chloride with metallic sodium, itself obtained electrolytically. The Hall-Héroult process lowered production costs to such an extent that between 1885 and 1895 the price of aluminium fell from about 20 shillings to about 2 shillings a pound ; but the new process, to fulfil its promise, required abundant supplies of cheap electric energy, of which some 8-10 kWh were needed for every pound of metal produced.

Thus in the years following the work of Hall and Héroult there was a demand on an unprecedented scale in many countries for cheap electric power for aluminium production. Aluminium reduction works were set up at the sites where the power was generated : and it may be noted that even to-day, when there is a tendency to site new plants at places where not only power but also bauxite is available, a number of major aluminium projects are being considered overseas in countries which, though liberally endowed with potential power, are yet remote from bauxite supplies. Cheap power is still a basic need in aluminium production.

History of the Scottish Industry

Virgin Aluminium. Scotland possesses no bauxite, but it was seen in the 'nineties to have undeveloped water-power supplies on a scale vast by contemporary standards. The British Aluminium Company was formed at the end of 1894 to acquire the British rights in the Héroult and Bayer patents. Lord Kelvin was a Technical Adviser to the Company from the start, and continued to serve in this capacity until his death in 1907. Fig. 1 shows a facsimile of part of Kelvin's first report to the Directors. The Company was also joined early in 1895 by its first engineer, a young Scot, William Murray Morrison, then 21 years of age, and for nearly half a century thereafter Morrison, later Sir Murray Morrison, guided its further expansion and development.

The Company's initial operations were at the Falls of Foyers


for the application of Héroult's process are abundant supplies of Alumina and Cryolite at sufficiently moderate cost: and abundant water power to drive dynamo-electric machinery for the extraction of the metal from the ore. I have carefully examined the detailed proposals of the British Aluminium Company for applying this process to the production of pure Aluminium and for the making of such of its alloys as have already been found useful or may be found useful in the future for practical purposes and I believe them to be well adapted to secure commercial success for the undertaking.

Kelvin

The University
Glasgow
Nov 8/94

Fig. 1. Facsimile of part of Lord Kelvin's first report to the Directors of The British Aluminium Company.

adjoining Loch Ness, where a small hydro-electric plant generating 5000 horse-power from a catchment area of 100 square miles was set up, production of aluminium commencing in June 1896 at the rate of about 200 tons a year, out of a total world production of about 2000 tons a year. Even this small output could not at first be disposed of, and part of the available power was used for a number of years for the production of calcium carbide for the acetylene industry. Capacity production was reached by 1904, when the world figure stood at 9000 tons, and steps were taken at once to secure further power facilities.

The British Company had promoted a Loch Leven Water Power Act in 1901. Now, in 1904, a further Act was passed bringing the former scheme up to date; and contracts were placed immediately for building the Blackwater Dam at the western end of a chain of lochs stretching from Rannoch Moor to the neighbourhood of Kinlochleven in Argyllshire and collecting water from a total catchment area of

66 square miles with an average annual rainfall of over 80 inches. This dam, over half a mile in length, with a maximum height of 85 feet and a breadth of 62 feet at its base, had the largest cubic capacity of any dam constructed in this country, and the storage reservoir it created was over eight miles long. A power-house generating some 35,000 horse-power from the waters of the Blackwater Reservoir, a new reduction plant, and an associated factory for making the carbon anodes used in the reduction furnaces were also put in hand, all at Kinlochleven ; and by 1909 full production was under way, with the Company's production capacity for aluminium ingot standing at about 10,000 tons, against a world production of 33,000 tons.

Up to this time, alumina for reduction at Foyers and Kinlochleven had been made at the Company's plant at Larne Harbour in Northern Ireland. The bauxite originally used was mined in Co. Antrim, but it had soon become apparent that this was much too impure for economic extraction by the Bayer process. Deposits in the south of France, containing 58-60 per cent. alumina with 3 per cent. or less of silica, were therefore acquired and the Larne factory continued on the basis of the French material. With the increasing demand for alumina for Kinlochleven and for the Norwegian interests acquired by the Company from 1907 onwards, additional alumina capacity became necessary ; and a new site was sought that would have the advantages of being situated near a coalfield—since coal is such an important factor in alumina production—while possessing good harbour facilities for importing the bauxite and shipping the product. Plans were therefore drawn up in 1912 for the installation of a new alumina factory at Burntisland on the Firth of Forth where all these requirements were met.

The onset of World War I delayed this project, but the Burntisland alumina plant was eventually put into operation in 1917. During World War II, when French bauxite ceased to be available, further sources of supply were developed on the Gold Coast and in British Guiana, and an additional alumina plant was established in England at Newport (Mon.). To-day Burntisland still uses bauxite from these new sources, in addition to French ore, handling about 100,000 tons of bauxite a year.

Between 1913 and 1919, world production of aluminium rose from 70,000 to 150,000 tons a year as the direct result of the needs of the aircraft industry. Aluminium and its alloys became familiar materials, and their potentialities were recognised in many branches of engineering. Realising the industrial trend, the British Company sponsored in 1918 a further scheme for the production of the metal in the West Highlands ; and eventually the Lochaber Water Power Act, 1921, was passed, paving the way to a major power-and-aluminium project to be carried out in three stages, each requiring Parliamentary authority. These stages comprised : (1) damming the northern end of Loch Treig and providing a fifteen-mile pressure tunnel through solid rock round the northern side of Ben Nevis, to convey its waters to a new power-house just outside Fort William ; (2) damming the western

end of Loch Laggan and conveying its waters by a three-mile tunnel to Loch Treig; and (3) providing engineering works at the head-waters of the River Spey to enable the flood-water to be diverted by an

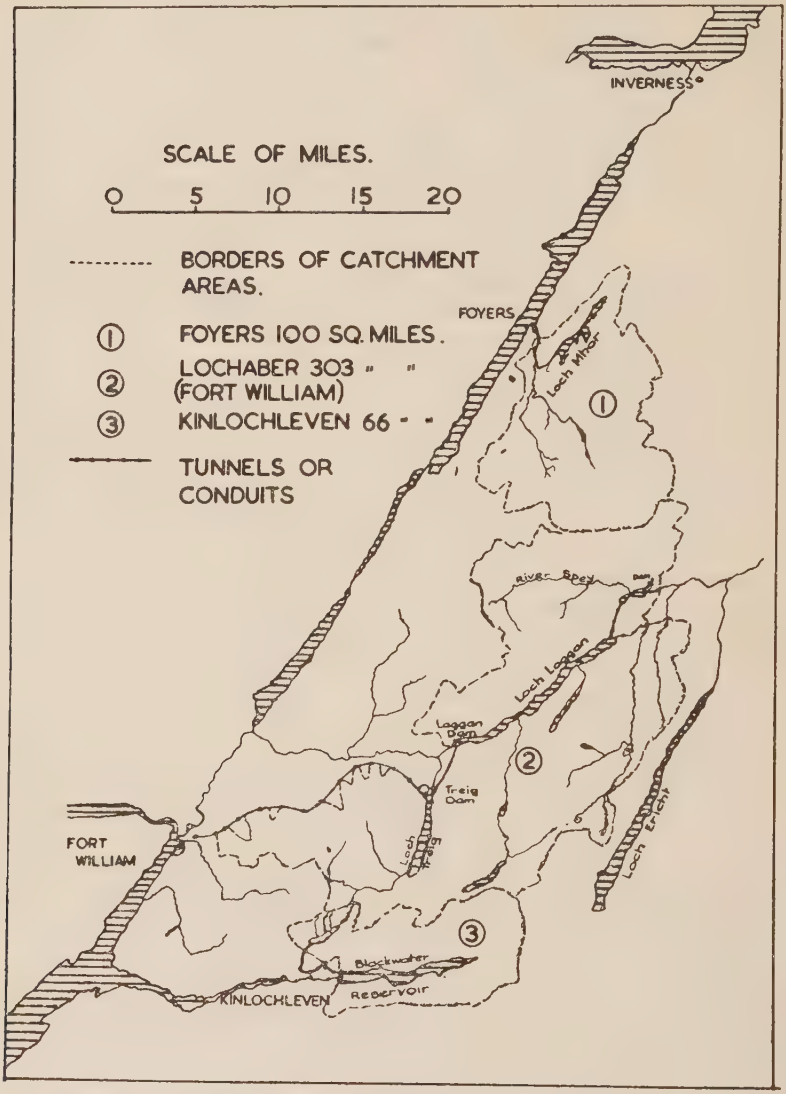


Fig. 2. Catchment areas for hydro-electric power generated and used at The British Aluminium Company's reduction works at Foyers, Fort William, and Kinlochleven.

open conduit to Loch Laggan, with the result that this flood-water eventually flowed into the Atlantic Ocean instead of the North Sea.

Aluminium production was commenced in a new plant near Fort William—the Lochaber Works—immediately stage 1 was completed, in December, 1929; stage 2, with attendant extensions to the power-

house and production plant, was fully operating by 1938 ; and stage 3 was completed in 1943. Together they constitute to this day the biggest single hydro-electric development in this country ; and by providing 120,000 horse-power continuously throughout the year they raised the combined capacity of the Company's Highland Reduction Works to the figure of something over 30,000 tons a year at which it now stands.

The extent of the three hydro-electric schemes is shown in Fig. 2.

Through all this period the size of the reduction furnaces had been progressively increased and their efficiency raised, while steady improvements had been effected in the construction of the carbon anodes used. Current capacities increased by stages from the 8000 ampères of the largest of the original Foyers furnaces to the 40,000 ampères now being used at Kinlochleven and still larger ones at Lochaber, while the continuous or ' self-baking ' Söderberg anodes were steadily introduced to replace the pre-formed and baked anodes formerly employed.

Semi-Fabricated Forms of Aluminium and its Alloys : Rolled Products. The British Company was associated in its earliest days with the formation in 1898 of a company called Scottish Aluminium Ltd. which set up an aluminium rolling-mill at Greenock. This company was established in anticipation of a demand for wrought metal which, unfortunately, did not quickly materialise ; and it was compelled to wind up after a few years. It may be mentioned, however, that sheets of aluminium incorporated in Sir Thomas Lipton's first yacht *Shamrock* were rolled at this Greenock mill.

Thereafter, until World War II, all the Company's rolled products and extrusions were produced at its rolling-mills at Milton in Staffordshire, which had been taken over and extended in the late 'nineties, and at Warrington in Lancashire. Between 1939 and 1944, the capacity of the aluminium fabricating industry in the United Kingdom was increased fivefold to meet war requirements. Among the major production units contributing to this increase was a new rolling-mill at Falkirk, laid down in 1942 and operated by the British Company, who purchased it from the Ministry of Supply in 1946.

This Falkirk mill represented an advance in rolling-mill conception and technique new to this country, in that it sought to apply to aluminium and its alloys continuous coil-rolling methods for sheet production as already adopted in the steel industry. It was in consequence highly mechanised, having incidentally a power consumption per employee some three times as great as that of older pre-war mills producing similar products, and being designed essentially for the processing of rolling slabs of large unit weight—up to two tons. Its major plant to-day produces sheet and coiled strip up to four feet and six feet in width respectively, and is provided with sheet-finishing equipment.

Though the Falkirk plant was designed originally for the production of heat-treated strong-alloy sheet for aircraft purposes and is still continuing to produce material of this type, it has also served since

the war, with some adaptation, for the economic production of sheet, strip, and plate in pure (over 99 per cent.) aluminium and in the common and medium-strength alloys for commercial and peace-time uses, including those referred to in the next section. Even at the present day Falkirk could already absorb more than the whole of the ingot produced at the Highland Reduction Works, but it is being expanded by 50 per cent. to bring the plant into balance for current production needs.

Aluminium Manufactures. Prior to World War II the casting of aluminium and its alloys was the principal field of manufacture in Scotland, but since the war ended products of the most diverse types have come into production. These include: applications in the shipbuilding industry on Clydeside and at Burntisland; housing, both for home and export, in pre-fabricated form, in Ayrshire; plant for the chemical and food industry, at Glasgow; hollow-ware, both cast and spun, in Lanarkshire; general sheet-metal work in the neighbourhoods of Glasgow and Edinburgh; and section-rolling in Ayrshire. The end-products include such diverse goods as refrigerators, bakers' trays, pit lockers, and lifeboats. Some of these newer applications of aluminium are considered on a broader basis in the section which follows.

Some Present-Day Applications of Aluminium

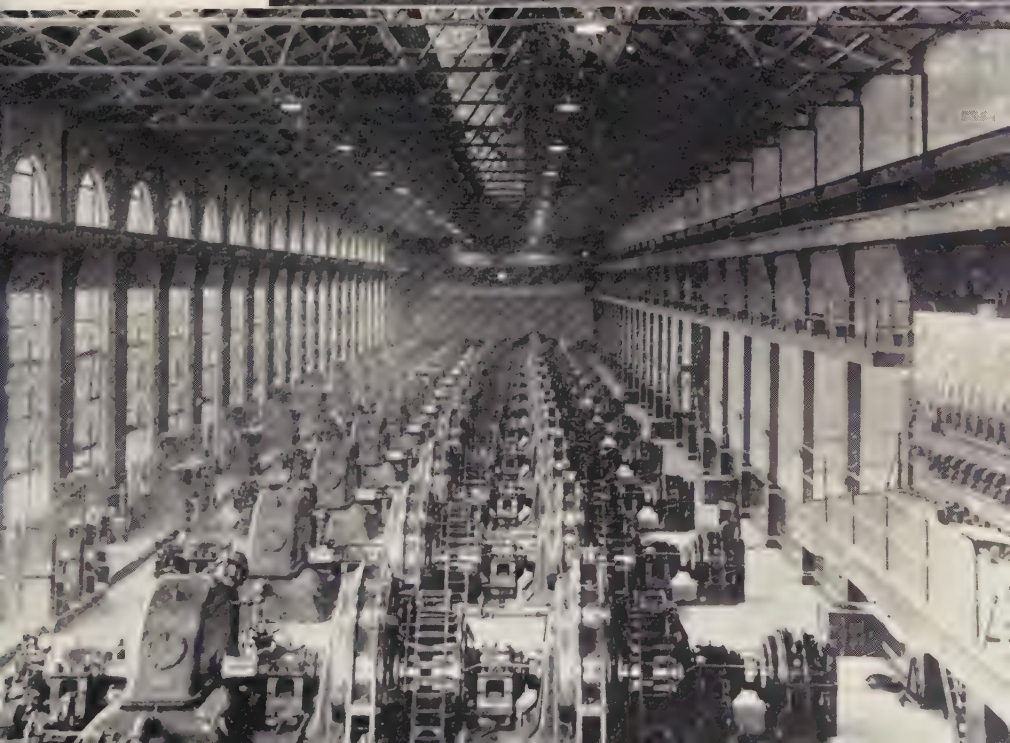
Reference has been made to the war-time expansion of the aluminium fabricating industry in the United Kingdom during World War II, during which all available metal was diverted to aircraft production, and the vigorous civil development programmes of the fabricating industry had temporarily to be set aside. In re-establishing these programmes in the post-war period, the fabricators discouraged purely substitute uses of aluminium based on temporary shortages of traditional materials, and concentrated their development effort on new markets which offered sound long-term prospects.

Prominent among these have been the building, structural engineering, transport, and shipbuilding fields. The aluminium-house programme, which produced some 50,000 houses during the post-war years as part of the Government's solution to the housing problem, gave way by degrees to the production of aluminium roofing and siding for many types of building both here and overseas. The lessons of pre-fabrication had been learnt, and the advantages inherent in the strength, lightness, and corrosion-resistance of aluminium alloys were put to wide use. New forms of corrugated aluminium sheet particularly suited to use in industrial buildings are now being developed, at Falkirk as elsewhere, and are being extensively used in the Falkirk rolling-mill extensions referred to previously.

The acceptance of aluminium as a structural material has been one of the most significant features of post-war development and an event of great importance in the history of engineering practice. The first large aluminium-alloy bridge in the world—the twin-bascule Wear bridge at Sunderland, opened in November, 1948—is to be followed by another bascule bridge at Aberdeen, both constructed by

LAGGAN DAM

OCHABER ALUMINIUM
DUCTION WORKS
'DRO-ELECTRIC
WER HOUSE



LOCHABER
ALUMINIUM
REDUCTION
WORKS

Head, Wrightson and Company. Such structures permit full use to be made of the strength-lightness ratio of aluminium alloys, in reducing the cost of the foundations of static structures and in increasing the speed of operation of moving parts or reducing the power needed for their operation.

Road and rail transport are further promising fields for development, though it will be recognised that aluminium castings have long been used, especially in road vehicles, for engine-blocks and other major housings.

When we come to the shipbuilding industry, we meet further points in favour of the introduction of aluminium alloys as constructional materials ; and here development has been intense. The use of such alloys for the entire hulls of lifeboats and other small craft has the obvious advantages deriving from lightness ; but their use in the funnels and superstructures of larger vessels adds a further factor in increased stability. In practice this gives the ship-designer a new freedom in design, but whether he uses this to achieve a reduction in draught—for river steamers or barges—or power-saving due simply to weight reduction, or increased passenger or freight accommodation, depends on the type of vessel considered. Scottish shipbuilders are now active on many of such developments, confident that they are technically and economically justified.

It will be appreciated that space does not permit discussion of the many other fields of application opened up by the availability of aluminium at economic prices.

Future of the Aluminium Industry in Scotland

If the great expansion in aluminium fabricating capacity in the United Kingdom since 1939 was occasioned by wartime needs, its continued employment has depended not only on the technical factors discussed above but on the relative price movements of aluminium and other metals over the same period. While the price of aluminium ingot has undergone relatively small changes during the period, prices of other non-ferrous metals have greatly increased, and even that of steel has more than doubled. This is shown clearly by the trends in volume indices for a given expenditure, as summarised in the following Table :

U.K. Metal Prices, 1939-1950

	Density	Sept. 1, 1939		Sept. 1, 1945		Sept. 1, 1949		Sept. 1, 1950	
		(*a*)	(*b*)	(*a*)	(*b*)	(*a*)	(*b*)	(*a*)	(*b*)
Steel (basic billets, soft U.T.) . .	7·83	7·4	438	12·2	240	16·8	191	16·8	230
Copper . .	8·93	51	56	62	41	107·5	26	202	17
Zinc . . .	7·19	15	235	31·5	101	63·5	55	127·5	33
Lead . . .	11·4	16·5	135	30	67	87	25	112	24
Aluminium . .	2·70	94	100	85	100	93	100	112	100

(*a*) Price in £ per long ton. (*b*) Volume Index for given expenditure, based on Al = 100.

As a result of all these factors, aluminium consumption in the United Kingdom in 1949, at 247,000 tons, surpassed its wartime peak, and there is every likelihood that given supplies of virgin ingot it will continue to grow. As noted above, the Falkirk capacity is now in process of expansion by some 50 per cent. to help meet these growing requirements.

We may note here, as an indication of the importance of the aluminium industry in Scotland, that the basic industry alone—from ore-treatment to the preparation of semi-manufactured products for subsequent conversion to manufactured goods—already employs over 4200 persons. It is evident that the total numbers employed on the production and use of aluminium can be expected to grow steadily as its applications develop. We need only consider the great potential demand of the shipbuilding industry and the favourable location of Falkirk in relation to the Clyde. We might consider also the probable extension of the uses of aluminium in the great Scottish fishing industries and its use for canning fish, on lines developed with success in Norway.

So far as virgin aluminium is concerned, the Scottish industry must be regarded as having reached saturation, since all economic available power is fully taken up. The balance of U.K. needs of ingot is met almost entirely by imports from Canada, where huge reduction facilities were installed during World War II : in 1949, some five-sixths of U.K. virgin aluminium supplies were so imported, but obviously this entailed the expenditure of dollars. The British Aluminium Company are accordingly seeking non-dollar sources of virgin ingot, and their chairman announced in 1948 that they were contemplating further expansion of their virgin metal output within the Empire.

It will be seen, in conclusion, that the prophetic words of Lord Kelvin at the Company's first Annual General Meeting in July, 1896, when he spoke of "looking forward to the benefits for Scotland which have been begun by this work," have come abundantly true. There is no doubt that aluminium production, fabrication and application, in which Scotland was one of the early pioneers, has become a vigorous industry conscious of a great future, and that it will continue to play a vital part in the country's industrial progress.

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GEOGRAPHICAL REGIONS OF THE GAMBIA

By H. Reginald Jarrett

In a previous article the writer suggested a scheme of division of the Gambia Colony and Protectorate into major natural regions.[1] It may be instructive to compare such a division with one into geographical regions which takes note, in addition to the facts of physical geography, of human geography too. This will be, therefore, essentially a study of how economic and social organisation in this small area have adjusted themselves to the physical background.

It will be clear that a feature of human geography such as the international boundary between the Gambia and Senegal is likely to be of significance with regard to our study of geographical regions, since such political boundaries tend to take on an economic and social significance. So it is hoped that it is not altogether illogical and arbitrary that the boundaries of the regions here suggested coincide in part with the political limits of the Gambia itself. These are geographical regions of the Gambia : the writer does not feel himself competent to attempt an analysis of their setting within the broader framework of Senegambia.

With these preliminary points in mind we may proceed to the recognition of the geographical regions with which this article is concerned. As a pioneer attempt the scheme is, of course, tentative, but it might be urged, in the writer's view very strongly, that the terms " Lower River," " Middle River " and " Upper River " introduced here are in general use in the Colony, and that each name does convey something fairly well defined to the mind of a person who is familiar with the Gambia.

The scheme of sub-division suggested (see Fig. 1) is as follows :—

1. *The Metropolitan Region.* This is the area sufficiently near the Capital to feel the economic and social effects of such a position. Physically, the region extends chiefly over part of the Tertiary Sandstone area (part of the " Sandhills Region ") and over some marine sands (part of the " Coastal Region "),[1] and the justification for the recognition of it as one of our geographical regions is to be found in the facts of human geography. Economically and socially the region is orientated towards Bathurst, a fact emphasised by the fairly comprehensive road system radiating outwards from the capital,[2] so that transport facilities are much better than anywhere else in the Gambia. Some of the roads are actually surfaced with tar, though road surfaces generally, particularly in the case of second-class and inferior roads, leave much to be desired, and constitute an undoubted handicap, both during the rains, when they are apt to be waterlogged, and during the dry season when the dry sand which forms the only surface over long distances makes travelling by motor car or lorry a matter of great difficulty. It is just as easy, on occasion, to be ' bogged ' in loose sand as in mud. This problem is apt to be particularly acute in villages where constant use has produced a road surface consisting of deep loose sand.

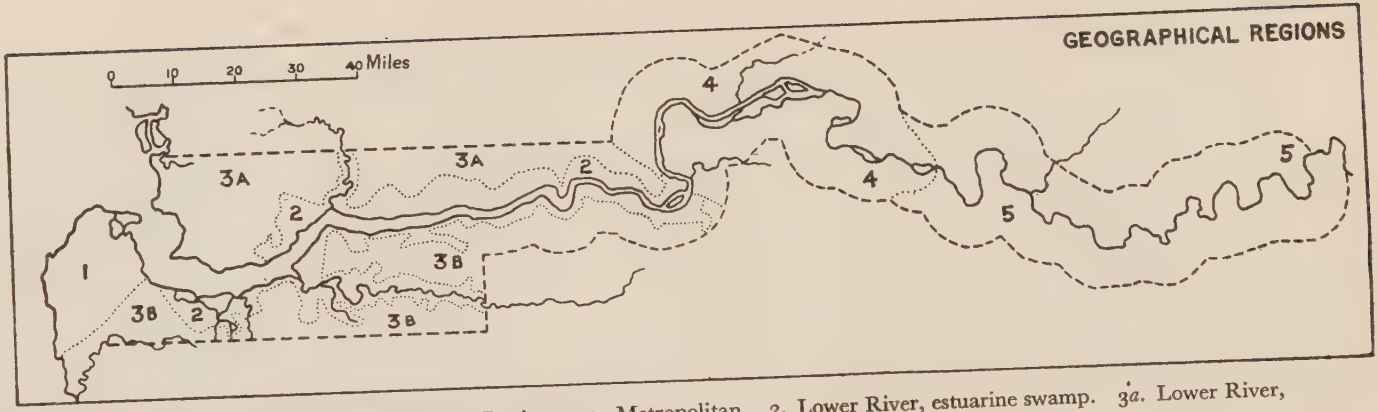

Fig. 1. The Gambia. Geographical Regions: 1. Metropolitan. 2. Lower River, estuarine swamp. 3*a*. Lower River, North Bank. 3*b*. Lower River, South Bank. 4. Middle River. 5. Upper River.

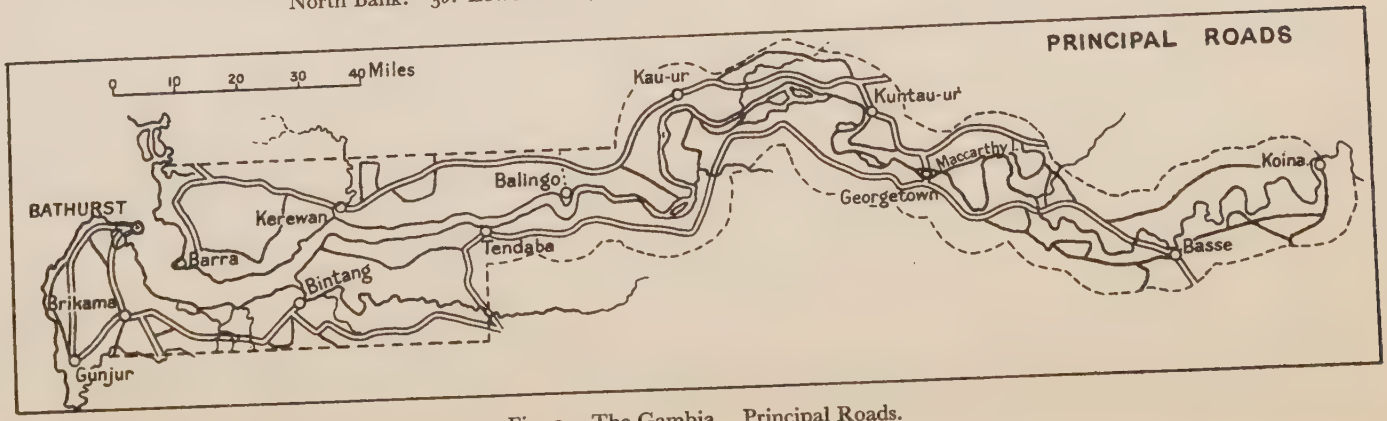

Fig. 2. The Gambia. Principal Roads.

If this road network radiating outwards from Bathurst is ever developed over a larger area, it may well be that the metropolitan region will increase in area. The boundaries suggested have been drawn solely with reference to the existing road system, and the correspondingly greater accessibility of all parts of the region to Bathurst (see Fig. 2).

This region, then, is tributary to Bathurst, for it will be clear that a town of over 21,000 inhabitants will need to draw heavily upon the resources of its rural hinterland for most of its food supplies ; it should be the function of this metropolitan region to supply, as far as it can, food to Bathurst. Full use has not been made of this region in the past, and it is one of the recommendations of a recent Report [3] that the area around Bathurst should concentrate on the growing of fruit and vegetables for the urban market. Plentiful use of compost is urged, to enrich the sandy soils. There are undoubtedly great possibilities in such a scheme, especially if some form of mixed farming, including dairy farming, could be included as part of the general economy, for the lack of fresh milk and milk products is a sore miss in Bathurst, as it is over most of the tropics. The area as a whole, including Bathurst, might well benefit from the large-scale farming developments now in progress near Fajara, which aim primarily at supplying eggs and dressed poultry for the British market,[4] but experiments in mixed farming also form part of the scheme.

A further possibility might be the distribution in this region of Bathurst refuse, including night soil, as a fertiliser or to be used in the production of compost. At present no use of any kind is made of this fertile potential, and this represents a waste which the Colony can ill afford.

At present, while a privately-owned ferry service operates between Bathurst and Barra, on the north bank, it takes passengers and personal luggage together with very light goods only. The service is not a frequent one. If it were ever found practicable to use larger vessels on a more frequent service, and thereby to increase the carrying capacity of the ferry, parts of North Bank Province around Barra might also be brought into this metropolitan region.

2. *The Lower River* (*estuarine swamp section*). Physically this region consists of mangrove swamps and banto faros subject to saline flooding. Because of their salinity these river flats are at present not much used for rice growing, and they are of little economic use,[5] but if more saline-resistant varieties of rice can be perfected and introduced, the possibilities of the lower river as a rice-producer will be greatly increased. This is already recognised by some, at least, of the local inhabitants : as one chief put it at a recent Conference, " We need good rice seed for salt water. Men will take up rice farming in brackish swamps if the seed can be obtained." [6]

There is practically no settlement in this region, which is not surprising in view of the physical environment : swampy, disease-ridden and unhealthy.

3*a* and 3*b*. *The Lower River* (*sandstone regions of North Bank and South Bank*). These regions flank the previous one to the north and

south, and physically they include most of those parts of the Tertiary sandstone areas in the lower river—that is, below Elephant Island. The soils are light and sandy, so that although some upland rice is grown here, these are primarily groundnut areas, and it is in these regions that recent reports have suggested the opening up of two new areas of groundnut production with the help of modern mechanisation —one in Lower Niumi and the other in West Kiang.[7] Other recent recommendations have included suggestions that efforts be made to increase the cattle population, especially of North Bank Province, and that the growing of fruit and vegetables might well be encouraged and extended.

Population in these regions is said to be increasing at a fairly rapid rate, and the density of settlement is well up to the average for the Gambia. Thanks to the physical environment based upon the slightly elevated, well-drained Sandhills and Interior Plateau Regions, with their agricultural and pastoral possibilities, these healthy areas attract settlement and may be more developed in the future if the recommendations here mentioned are ever put into practice.

4. *The Middle River.* This region as here recognised extends over both the swamps and the Tertiary sandstone areas in the middle river. Physically, then, it is not homogeneous. From the human standpoint, however, it can fairly be argued that there is a unity of organisation embracing the two physically diverse areas. Settlements no longer avoid the banto faros,[8] and both the banto faros and the sandstone areas play their share in the organisation of village life—the women work in the rice fields of the swamps while the men are more concerned with other types of agriculture and a little pastoral farming in the remainder of the region. Part of the economic activity of a typical village, therefore, will be directed towards the cultivation of the rice swamps, and part towards the utilisation of the uplands, so that from the human standpoint the two physical components are complementary, each one making its special contribution to the human welfare and economy of the inhabitants. Herein lies the justification for the marrying of them into the one " Middle River Region."

This is, above all, the rice-growing area of the Gambia—indeed one might almost describe it as the granary of the Colony. The soils of the banto faros are good, and include some of the best in the Protectorate, and all authorities agree that much more rice could be grown here than is grown at present. The banto faros in the middle river are subject to fresh-water, not saline, flooding, and they cover a greater proportional area in this region than anywhere else in the Colony. Hence there is every encouragement for this region to develop an important rice-growing industry. A recommendation has recently been made that a mechanised rice-growing scheme, covering an area of 36,000 acres, should be started in the middle river, and the recommendation is being examined " as a matter of urgency." [9] If such a scheme comes to fruition, it should make the middle river one of the most productive areas on the West Coast of Africa, certainly on the Gambia itself. Its possibilities are very great. It is said that mechanical cultivation is hindered by the absence of empoldering to

dry out the rice land sufficiently to carry tractors, and that empoldering has been found to be inadvisable in some areas as it leads to a concentration of iron sulphates which produce soil sterility.[10] Experiments are, however, continuing.

On the upland soils of this region, of course, the general 'farming' economy practised chiefly by the men, with seasonal help from the women (especially during the groundnut harvest), is similar to that practised on the similar soils of the lower river, groundnuts forming the chief crop.

5. *The Upper River.* This Region extends up river from the neighbourhood of McCarthy Island, and, as here delimited, includes the upper river banto faros and the neighbouring parts of the sandstone areas. It may seem, therefore, as though this region consists like the previous one of two diverse physical sections, and from a geological point of view this is the case. In practice, however, it is doubtful whether this distinction is of very great validity for two reasons. Firstly, the banto faros, which are here comparatively narrow, stand at a higher level than elsewhere in the colony, and flooding therefore, while it does occur, is correspondingly less severe and not so widespread; secondly, the soils of the banto faros are lighter and more sandy than those farther down river, and as far as could be seen from an examination which had to be rather sketchy and less thorough than the writer would have preferred, there is no very pronounced difference between them and the soils of the sandstone areas proper, though they may be a little heavier. These facts taken together give rise to a greater homogeneity in the region than might be expected.

The region, as we might suppose from what has been said about the nature of the soils, is less a rice area than a groundnut and coos area. "Fulladu is not as good a rice area as that of the Niaminas, but it is a coos and groundnut area," [11] and this quotation might quite well be taken as applying to the whole area, with its comparatively restricted banto faros and the correspondingly increased area of upland soils. The large proportion of land under groundnuts at the eastern extremity of the Protectorate has been emphasised elsewhere, where it is said that "Yarbutenda . . . is surrounded by groundnut fields." [12] Hence this region needs to 'import' rice as a general rule from other areas, partly because of the rather high density of population. This is the only part of the Gambia where there is said to be some pressure on the available land.

It has been recommended that efforts be made to increase the numbers of cattle in Upper River Province, and that irrigation schemes be initiated in order that full use might be made of the soil.[13]

Finally, a word might be said about the siting of the boundaries between the various regions suggested in this chapter—which, as has already been emphasised, are entirely tentative. The metropolitan region boundary, as explained above, was drawn with reference to the existing road network, and the consequent ease of accessibility of Bathurst: all places within the region have good access to the capital. The boundary, between the lower and middle river, was drawn across the Colony close to the head of the estuary, near the

limit of saline flooding, where the middle river banto faros begin to open out in extent, and where a study of the maps issued by the Directorate of Colonial Surveys showed that more extensive rice cultivation begins.[13] The correspondence in space of these several factors seemed to denote a change of physical and economic emphasis justifying the regional distinction made. The division in the Lower River between the Estuarine Swamp and the Sandstone areas is based, of course, upon underlying geology. The last boundary, near to McCarthy Island, is again drawn across the Colony in the area where the river gradually emerges from a more incised valley, and where the broad middle river banto faros are replaced by the narrower ones of the upper river.

We see, therefore, that even in this small Colony and Protectorate geographical conditions are surprisingly diverse, and there is, therefore, a wide range of problems awaiting solution before all the various resources within these narrow, arbitrary, political confines are utilised to the fullest extent. It is to be hoped that as a result of the deeper interest now being shown in the tropics generally, and in the tropical British Commonwealth, areas like the Gambia will be stimulated into a greater economic and social activity which will produce greater prosperity than they have known hitherto.

A brief Note on Farming in the Gambia

While it is not the purpose of this article to give a descriptive account of the farming practices of the Gambia, it is felt that some knowledge of them is perhaps needed for a full understanding of the subject, and so a few brief descriptive notes are appended.

1. *Systems of Land Use.* On the banto faros cultivation is fairly permanent. The men enclose selected swamps by building up *bunds* of mud and reeds, and the rice fields so formed are cultivated year after year by the women. One woman's strips, however, may be scattered over a wide area. On the uplands "shifting cultivation"—or as Professor Hancock prefers to call it, "an extensive rotatory agriculture with long periods of bush following" [14]—is followed, and is the responsibility of the men.

2. *Crops.* Rice in the swamps. On the uplands the groundnut is the important cash crop and by far the most important export of the Colony, accounting over the years 1936-46 inclusive for 95·6 per cent. by value of all exports according to calculations made by the writer. Upland food crops consist mainly of various forms of millet, the early varieties (chiefly digitaria known as 'findi' in the Gambia) of which are sown broadcast in June, often on impoverished land as a catch crop, the later ones (chiefly pennisetum known as 'sanyo' in the Gambia) being sown more carefully in July. These later crops often are rotated with groundnuts on cleared land, until the land is impoverished when infestation with 'silo,' a parasitic weed (*Striga senegalensis*), leads to rapid diminution of yield. It is on such land that the digitaria is usually broadcast. On the 'in-farms,' small patches of more permanent cultivation near the villages, other crops such as maize, vegetables and tobacco are grown, but the overall poverty of

the food production will be apparent. Very little fruit is grown except near Bathurst.[15]

3. *The Farming Year.*[16] Preparation of farm land begins in May, early upland crops (chiefly findi and maize) being sown in June. In July are planted groundnuts, later millets (sanyo), and rice nurseries which are transplanted in August. The main upland harvest of grain starts in October, though maize and findi are available in September, the groundnut harvest begins in November and the rice harvest in December. Harvesting of all crops is completed by February, so that March and April are slack months. If the food does not last until the following harvest begins, there is a 'hungry season,' which can be very painful and distressing.

4. *Animal Husbandry.* As in so many parts of Africa, animals have not the importance which they have especially in many temperate lands.[17] Sheep are reared in most areas, but are of subsidiary importance, while it is only recently, thanks to compulsory inoculation against rinderpest, that the cattle population has increased appreciably. To-day there are said to be probably 100,000 cattle in the Protectorate,[17] which works out at an overall density of about 25 per square mile. Dairy farming and mixed farming are but little known, though they are being encouraged from official quarters.

[1] *S.G.M.*, 1949, 65 (*3*) : 140-144.

[2] See sheet No. 10 of the map of the Gambia (1 : 50,000) published by the Directorate of Colonial Surveys, Teddington.

[3] Report of Department of Agriculture, 1945. Bathurst, 1945.

[4] For details see Colonial Development Corporation : Report . . . for 1948, H.O. 188. London : H.M.S.O., 1949, pp. 17-18.

[5] See relevant 1 : 50,000 map sheets, *e.g.* sheet No. 11 (Sika).

[6] Summary of Proceedings of the Second Conference of Protectorate Chiefs held at Brikama, 1945. Bathurst, 1945, p. 12.

[7] Report of West African Oilseeds Mission. *Col. no.* 224. London : H.M.S.O., 1948.

Report of the Mission appointed to enquire into the Production and Transport of Vegetable Oils and Oil Seeds produced in West African Colonies. *Col. no.* 211. London : H.M.S.O., 1947.

[8] Jarrett, H. R. Population and Settlement in the Gambia. *Geographical Review*, 1948, 38 (*4*) : 633-636. See accompanying map.

[9] *Crown Colonist*, April 1949, p. 205.

[10] Colonial Annual Reports. The Gambia, 1947, p. 17. London : H.M.S.O., 1949.

[11] Summary of Proceedings of the Second Conference of Protectorate Chiefs, 1948. *Op. cit.*, p. 15.

[12] The Red Book of West Africa. London, 1920, p. 274.

[13] Particularly, sheet No. 15.

[14] Hancock, W. K. Survey of British Commonwealth Affairs. Vol. 2, Part 2, p. 238. London : Royal Institute of International Affairs, 1942.

[15] Land-use map of the Kuntau-ur area in the *Geographical Magazine*, November 1949, p. 270.

[16] Gordon, J. Notes on Yoroberikunda Village and Agriculture. Bathurst, 1946, p. 4.

[17] Colonial Annual Report, 1947. *Op. cit.*, p. 16.

GEOGRAPHY IN CANADA

By J. Wreford Watson

The Canadian environment has profoundly influenced the history, economy, and social development of the country. One has only to recall the influence of the rivers and river portages on early exploration and transportation ; the barrier-like effect of the Appalachians on political growth and of the Canadian Shield on economic maturity ; the rôle of frost and drought on prairie settlement ; the control of settlement by topography in British Columbia, and the consequence of the central position of Ontario and Quebec on the industrial structure of Canada, to realise that Canada's problems and opportunities can be attributed in an unusual degree to its geography.

Nevertheless, Canada has been slow in developing the study of geography and in putting it into practice in the affairs of the nation. It was not until 1935 that the first university department of geography was established. This was at Toronto, where the President, Dr. Cody, had the foresight to pioneer in this field. Professor Griffith Taylor became Canada's first geographer, and since then has directed and inspired the evolution of the subject until it has now achieved wide recognition in Canadian education and in government circles.

Fully fledged departments of geography have been set up at McMaster University (1942), McGill University (1945), the University of Montreal (1947), and the University of Western Ontario (1949). There also exist joint Departments of Geography and Geology at the University of British Columbia, and of Geography and History at Laval University. In addition there are lectureships in geography at Memorial College, Newfoundland, Carleton College, Ottawa, and at Manitoba University.

These various centres have grown up with different traditions and, as a result, the courses offered for a degree in geography vary quite considerably. There is much less standardisation than in Britain. Consequently, each university has its special emphasis : that of Toronto is on cultural and regional geography, of McMaster on social geography, of McGill on climatology and arctic ecology, of Montreal on physical and industrial geography, of Western Ontario on conservation and planning, of Laval on historical geography, and of British Columbia on land utilisation and arctic development.

The success of these departments of geography has led to an improvement in the status of geography at school. Though long an integral part of elementary education, geography had not played a significant rôle in the secondary school. With the training of qualified teachers and the growing interest in the subject, it has now been accepted throughout intermediate school, and in some provinces is taught up to high-school matriculation.

Although as a discipline on its own geography has had a comparatively short history in Canada, a scholarly interest in geography has not been wanting, and several physiographers, historians, and economists have taken cognisance of the geographic factor in their research. In this respect Dean Harold Innis has long been a good friend of geography and has done a great deal to advance its interests.

In a country which is still partly pioneer in spirit and activity there must always be a marked emphasis on the practical value of a subject. The teaching of geography is increasingly concerned with its application to the problems of land utilisation, resource development, settlement, and public affairs. There are courses in the universities definitely directed to these ends, and it is probably true that more courses in applied geography occur than in Britain. One result is that the discipline is being used increasingly to serve business and governmental interests.

In the governmental sphere geography has been introduced only since the war years. Nevertheless, it has already made important strides. Actually, the term ' geographer ' had been used in government circles since 1898, when the Department of the Interior employed a ' geographer ' as a map maker. A geographic office was established in 1902, and in 1906 the Chief Geographer produced the first National Atlas of Canada. However, the functions of the post were taken over by the Chief Topographer, and the introduction of the new type of geographer, the specialist in area correlations, was made without too much difficulty or confusion.

During the recent war there began to be a growing concern about the north. Canada's strategic position in both the North Atlantic and the North Pacific made it aware of the need to develop and defend its northland. The Arctic Division of the Department of Mines and Resources hired Dr. J. L. Robinson as a professional geographer to conduct surveys of the physiography, ecology, and settlement of the Canadian Arctic.

About the same time an Inter-Service Topographical Section was formed in the Department of National Defence to make topographic studies of strategic areas. Out of this grew the topographic work of the Joint Intelligence Bureau, now headed by Major Ivor Bowen, which employs a number of young geographers.

After the war, the need was felt for a civilian agency of government to undertake geographic studies, and in the summer of 1947 the Geographic Bureau was formed in the Mines and Scientific Services Branch of the Department of Mines and Resources. Early in 1950 this bureau was reorganised and became the Geographic Branch of the Department of Mines and Technical Surveys, under the direction of the author.

Its functions are to undertake the basic geographical research for all Departments of the Federal Government, or, more specifically, to obtain, collate and organise all the material relating to the geography of Canada which could be of use to the economic and social life of the country ; to prepare studies on specific aspects of the geography of Canada for the use of those engaged in government, defence, business and scientific research ; and to obtain material relating to the basic geographic facts and conditions of foreign countries, to the satisfaction of national or institutional interests.

At the present time the regular staff of the Geographical Branch consists of sixteen geographers, six library and four cartographical personnel, together with clerical assistants. In the summer the staff

is increased by seasonal employees to four or five times its normal size. Work is divided into a Canadian Research Division, headed by Mr. Nicholson, and a Division of Research on Foreign Geography, headed by Mr. Bevan, along with the Cartographical Division, under Dr. Gajda, and ancillary services.

The Canadian Research Division is concerned chiefly with making area studies in the field and with the preparation of a new National Atlas of Canada. This summer, 1950, saw ten parties in the field making surveys of the physical and human geography of Labrador, of resource development in Newfoundland, of the expanding urbanisation of the Maritimes, of pioneer settlements in the Athabaska and Peace River valleys, of the ports of the Pacific coast, and of the ecology and development of Keewatin.

In connection with these parties the Branch and the Universities find a fruitful basis for collaboration. Professor Lloyd Reeds of McMaster, and two graduate students, made studies in Newfoundland; Professor Wonders of Toronto conducted other surveys there; Professor Putnam of Toronto, with three students, worked in Nova Scotia; Professor and Mrs. Bird of Toronto, with two graduates, explored Southampton Island; while Professor Zaborski of McGill, with two students, engaged in research in Northern Alberta. In the same way, collaboration on the Atlas of Canada drew upon the services of Professor Tatham of Toronto and Mr. Laurendeau of the University of Montreal. Other projects in the cartographical division and in the library and map library employed quite a number of keen young graduates from the Universities of McGill, McMaster, Montreal and Western Ontario.

The Division of Research on Foreign Geography began this summer by undertaking an exhaustive study of Bolivia on behalf of Dr. Keenleyside, the Canadian leader of a United Nations' Commission on Technical Development. This was used to brief members of the U.N. Commission before they went into the field. Similar briefings are made for Foreign Service Officers of the Department of External Affairs before they are appointed to serve in a foreign mission. The Division also supplies material of a topical nature to assist in informing policy about critical areas, such as the Far East.

The study of geography is also being applied at the provincial and municipal levels, and the seasonal employment of geographers on summer field parties making land-use and settlement surveys is increasing. The Lands Branch of the British Columbia Department of Lands and Forests, the Saskatchewan Department of Natural Resources and Industrial Development, and the Ontario Department of Planning and Development each engage geographers on their regional surveys. Similarly the town-planning boards of the major cities now use the special techniques which geographers contribute to the solution of urban problems.

Thus it may be seen that, although the study of geography and its application to public affairs have had a brief development in Canada, that development has not been without success; indeed, it can be said to augur well for the future.

SVALBARD OF TO-DAY

By R. N. Rudmose Brown

Svalbard illustrates the poleward drift of population as, little by little, men realise that the polar regions have something to offer and are not, in the main, hostile to human life. There are, broadly speaking, three categories of inhabitants : hunters and trappers, who were the very earliest explorers, and tourists, and, lastly, miners. All except a single trapper left Spitsbergen in 1941 when the population was evacuated by a British and Canadian force, and Svalbard was left for a time to the mercy of the enemy. This story is fully told in *Arctic War* [1] and *Combined Operations, 1940 to 1942*.[2] The trappers are back but in much reduced numbers, each of them licensed by the Norwegian Government and limited in his activities by the stringent game laws. Musk-oxen were introduced in 1929 and are now flourishing under State protection.

The tourists date well back to 1893, on a large scale, and in 1896 and 1897 there was a small tourist hut at Adventpynten served by a weekly steamer from Tromsö. Subsequently, for many years German and Norwegian steamers had most of the cruising traffic, which was on a luxurious scale. Strange to say, in spite of the inadequacy of the coastal charts, there has been no shipwreck or major accident to tourist steamers. One serious accident on record was when the Prince of Monaco's yacht *Princesse Alice* ran on an uncharted rock in Raudfjorden (Red Fjord) in 1899. The need of careful hydrographic survey was well illustrated in 1939 by the discovery of a totally unsuspected and dangerous shoal in the entrance to Magdalenefjorden near the usual track of tourist steamers. An innovation in the tourist traffic was the utilisation of the abandoned King's Bay mine buildings as an hotel. Started by C. Anker in 1916 as a coal mine and counter-claimed by several others, the site and shafts were abandoned, flooded and frozen in 1929. In 1941 an attempt was made to reopen the mine, but a few weeks later Ny Aalesund, in company with all other settlements, was evacuated to Russia and Great Britain. In 1936, however, some of the buildings of Ny Aalesund had been used as the Nordpolhotellet (North Pole Hotel). A. Hoel initiated the project which the Bergen ship-owner J. Kjöde expanded in 1938, with the help of a considerable subsidy from the Norwegian State. Nordpolhotellet closed for the time being in 1941. Ny Aalesund was not damaged by the Germans, and now is said to have been re-opened as a coal mine. Kongsfjorden is probably the best site for a Spitsbergen hotel on account of its accessibility by sea and the freedom of movement afforded ashore. Another possible site is Billefjorden near Bruce City. Kongsfjorden has the additional interest of being the starting place of several polar expeditions, including the flights of Byrd and Amundsen over the Pole. This would add to the interest of many tourists. It may be regarded as fairly certain that, before many years have passed, Spitsbergen will

Svalbard. Location of mining settlements.

have its luxury hotel, at least in the summer, with its connecting steamers to British and Norwegian ports. From 1935 to 1939 there was a Norwegian fishery station at Kongsfjorden.

Coal mining in the valuable seams in various parts of Isfjorden has restarted. As of old, the Store Norske Spitsbergen Kulkompani is the chief company at work. Its two principal properties, with easily accessible coal, are in Adventfjorden and Braganzavågen, Van Mijenfjorden. The former was American until 1915, and the latter was Swedish from 1917 until 1925. Longyearbyen in Adventfjorden, the mining settlement of the Norwegian company, was largely destroyed by the Germans in September, 1943, but is now rebuilt. Sverdrupbyen further up the valley was little damaged. Both mining camps have been enlarged. Einar Sverdrup, the director of the Store Norske, was killed in action at the mouth of Grönfjorden in May, 1942, to the profound regret of his many friends. Most recent expeditions to Spitsbergen remember with gratitude Einar Sverdrup's advice and practical help.

The Braganza mine, Sveagruva, as it is called, is badly placed for export, and from time to time there is talk of a railway along the north bank of Van Mijenfjorden to an anchorage on the north of Bellsund. Beacons in Bellsund and Van Mijenfjorden now lessen difficulties.

The only other mining claims of importance are the three coalfields in the possession of the Soviet Government. The largest and most accessible is Barentsburg on the east side of Grönfjorden which has been in turn Norwegian, American, and Dutch. In 1932 it became the property of the Russian State company Arktikugol, and was rapidly developed. The settlement suffered comparatively little during the war. The other estates belonging to the Russian State are Grumant, adjoining Colesbukta, first worked by an Anglo-Russian company in 1914, and Pyramiden on the west side of Billefjorden, Swedish from 1910 to 1926, and then Russian. The new mine at Pyramiden promises well, according to Russian reports. It may prove to be the chief Russian mine.

The majority of the estates of the Northern Exploration Company, of London, were sold to the Norwegian State in 1932. The claims included various so-called camps of one or more prospector's huts. Other huts, however, seem to have been abandoned. The reduced claims of the Scottish Spitsbergen Syndicate, of Edinburgh, dating from 1909, in Billefjorden and Templetfjorden with their coal and gypsum were transferred in 1950 to another British company when the original syndicate was liquidated.

Björnöya (Bear Island) has suffered similar desolation ; the coal mine (Tunheim), first worked in 1918, was closed in 1925. It belonged to Björnöyen A/S of Stavanger. Loading facilities are poor. The Norwegian State maintains a radio and weather station at Herwigshamna on the north coast.

The devastation that Spitsbergen mines, stocks of coal and houses suffered during the war period may be gauged by the total export figures of coal : 1938, 606,000 tons ; 1939, 611,685 tons ; 1940, 540,963 tons ; then a gap until 1945, 200 tons ; 1946, 62,732 tons ;

1947, 281,192 tons ; 1948, 420,324 tons ; and a growth in amount for successive years. The total population is now about 4000.

Radio stations were destroyed at the same time as the coal stocks and mines. They are now re-installed.[3] There is also a radar station at Kapp Linné, and a meteorological station on Hopen (Hope Island), the latter continuing a German war-time station.

Since taking over administration of Svalbard in 1925, the Norwegian Government has done much to facilitate and make navigation safer in adjoining waters by placing buoys, spars, and lights on various points and reefs on the west coast. These have been replaced since the destruction of war. Except during the war period, there has been an annual Norwegian expedition to Svalbard whose interests cover a wide field of work in various sub-divisions. The whole of the territory is now surveyed, much from the air, with land controls. A start has been made in issuing sheets on a scale of 1 : 100,000. The contoured sheets are in four colours and show sea as well as land features. Each is folded and issued in a cover.[4] Another very important publication is *Place-Names of Svalbard*.[5] Among many other numbers of *Skrifter om Svalbard og Ishavet* may be noted the *Outline of the Geological History of Spitsbergen*.[6] In Björnöya all the field work of a complete survey was finished in 1924.[7] A beautifully illustrated volume on Svalbard has recently been published in both Norwegian and English editions.[8]

While the discovery of geographical features in Spitsbergen and Björnöya are probably complete, there is detailed exploration to be done in geology, oceanography, and biology. Several private exploration parties have been at work every summer, including those from Birmingham, Cambridge, Leicester, Oxford, Stockholm, etc. The Norwegians have also paid attention to hydrographic survey in the waters between Spitsbergen and Björnöya—in Norway this is now the work of the Norsk Polarinstitutt. The last part of Svalbard to be explored scientifically and to be adequately mapped was Nordaustland (North East Land). It is too liable to be icebound, and a vessel that succeeds in reaching it may well be detained for the winter. Such an expedition must be prepared to winter, which, of course, presents problems which a summer expedition does not have to face. Several wintering expeditions, and at least one summer expedition, an Oxford expedition in 1949, have succeeded in exploring this little known and remote land.

The political history of Svalbard up to 1925 is solely of academic interest. In that year, Norway took over control in terms of the Spitsbergen Treaty of 1920 signed by the United States of America, Great Britain (with Ireland), Canada, Australia, South Africa, New Zealand, India, Denmark, France, Italy, Japan, Norway, Holland, and Sweden. The Soviet Union signed in 1924. Part of Article Nine of the Treaty is as follows : " Norway undertakes not to create or to allow the establishment of any naval base in the territories specified in Article One—these are the islands of the Svalbard Group—and not to construct any fortification in the said territories which may never be used for warlike purposes."

In 1944 the Soviet Government proposed to Norway the revision

KONGSFJORDEN—NY AALESUND

MAGDALENEFJORDEN AND KING JAMES I LAND

LONGYEARBYEN

Norwegian mining settlement. Adit at about 400 ft.

GRUMANTBYEN

Russian mining settlement

of the Treaty. Both States agreed that this could be done only with the consent of the other signatory powers. On February 15th, 1947, Norway repeated her willingness to discuss the revision of the Treaty under these conditions, but refused a bilateral discussion on the defence of Svalbard. Spitsbergen is obviously important in relation to the North Cape and Barents Sea route to and from northern Russia.

On August 7, 1949, H.R.H. the Crown Prince Olav unveiled a memorial at Longyear to the Norwegians who fell in action in Svalbard.

[1] Arctic War. London : His Majesty's Stationery Office, 1945.

[2] Combined Operations, 1940 to 1942. London : His Majesty's Stationery Office, 1943.

[3] Lyngaas, R. Oppføringen av Isfjord Radio, Automatiske Radiofyr og Fyrbelysning på Svalbard, 1946. *Norsk Geografisk Tidsskrift*, 1947, 11 (*5-6*) : 221-237. 4 figs. *Norges Svalbard Meddelelser*, Nr. 67.

[4] Topografisk Kart over Svalbard. 1 : 100,000. Blad C13 Sörkapp (1948), and other sheets. Oslo : Norges Svalbard- og Ishavs-Undersøkelser.

[5] Place-Names of Svalbard. *Skrifter om Svalbard og Ishavet*, Nr. 80. Oslo, 1942. [See review article : *S.G.M.*, 1944, 60 (*3*) : 67-68.]

[6] Orvin, A. K. Outline of the Geological History of Spitsbergen *Ibid.*, Nr. 78. Map. 1940.

[7] The Survey of Björnöya (Bear Island), 1922-31. *Ibid.*, No. 86. 1946.

[8] Svalbard : A Norwegian Outpost. Bergen : J. W. Eides Forlag. 1950.

GEOGRAPHY AT THE BRITISH ASSOCIATION

At this year's meeting of the British Association, Section E was housed in the new Geography Department of Birmingham University. Its programme touched on many aspects of geography and included some most enjoyable and instructive excursions. Since most of the papers give the results of individual research, it was not surprising that the great majority dealt with the British Isles. One session was devoted to the urgent and thorny problem of bringing order into the use of geographical terms in this country. It was introduced by a contribution prepared by Professor E. G. R. Taylor summing up the findings of the Committee of the British Association appointed in 1948 " To consider and report upon ambiguities and innovations in geographical terminology."

The first morning was devoted to four papers on the Birmingham region, and these provided a background for the excursions. In his introduction, Professor Kinvig stressed his objection to the common use of the term Midland Plain, since the Birmingham region in reality consists of a series of horsts or upraised blocks rising generally to over 400 feet and in places to 1000 feet, and locally there are quite steep

slopes especially towards the west, where short, swift rivers flowing to the Severn have dissected the Birmingham Plateau into a series of steep-sided ridges and valleys. A most interesting and able urban study of " The Development of Birmingham and its Industries since 1750 " followed. In this Mr. M. J. Wise outlined the growth of the city in relation to its site and to developments in commerce and manufacturing, pointing out the relative local advantages of the site and the disadvantages of the position off the major routeways from London to the west and north west and connected with these by approaches of considerable gradient. Mr. B. L. C. Johnston then gave a talk on " The Early Eighteenth Century Iron Trade in the Midlands," illustrated with useful distribution maps compiled from contemporary sources, and the morning was rounded off by a paper on " Factors influencing the Growth of Lichfield " by Mr. H. Thorpe, who traced the main stages in the growth of this ancient cathedral city and examined its functions at different periods.

Geomorphology was well represented. Professor S. W. Wooldridge chose as the subject of his presidential address " The Uplands Plains of Britain : their Origin and Geographical Significance." The recognition of the various more or less level surfaces which occur at different altitudes and are a most significant feature of the landscape of Britain—and other parts of the world—is of importance as a foundation for sound regional geography, and the explanation of their origin and evolution is a fascinating problem in itself. The whole of the Monday morning was devoted to contributions bearing on " The Pre-glacial Evolution of the British Land Surface." It included papers on the Southern Pennines, by Mr. G. T. Warwick ; County Clare, by Dr. Marjorie Sweeting ; and Exmoor, by Mr. W. G. V. Balchin ; and was introduced by a paper on " Some Considerations bearing on the Origins of the Midland Drainage," delivered in his usual clear and logical style by Professor D. L. Linton. The hypothesis he put forward most convincingly was that of a west-east flowing proto-Trent from Snowdonia to the Wash, of which parts of the present Trent, Cheshire Dee, and other rivers are the descendants.

Mr. A. J. Hunt dealt with the topical question of " Land Use Classification for Urban and Rural Survey," using as illustrations the former maps, which he prepared in 1939 from personal observation, showing functional distributions within Edinburgh. Mr. D. N. Kendall spoke on " Mapping Natural Resources from the Air," taking his illustrations from recent survey in Canada, where contour maps are now being made by aerial survey. Other economic geography papers were " The Geography of Coke," by Professor S. H. Beaver, most appropriate in view of the general theme of this year's British Association : " Man's Use of Energy " ; and " Some Aspects of English Coastwise Trade," by Mr. H. C. Brookfield. Two regional studies dealt with past developments and planning problems in other parts of the Midlands, Mr. H. A. Moisley considering " Some Aspects of the North Staffordshire Conurbation," and Professor K. C. Edwards " A New Town in the Midlands : Geographical Considerations affecting the Development of Corby." A paper by Mr. E. Jones on " Some

aspects of Settlement in Britain," illustrated by an example from Wales, was most useful in clarifying ideas on the study of settlements and the factors affecting them.

West Africa figured in three papers : Mr. R. W. Steel dealt with " Some Problems of Population Distribution in British West Africa," stressing its present unevenness and the varying natural conditions which lie behind that ; Mr. K. M. Buchanan, with " The Regions of Nigeria," providing amongst other material the background to the political problem of the relation between north and south ; and Mr. H. R. Jarrett, with " Problems of Tropical Agriculture with Special Reference to the Gambia." Papers by Miss M. Marshall on " Some Problems of Cyprus : Geographical Considerations," and by Mr. D. J. Sinclair on " Settled Regions of the Ukraine," were in the nature of interim reports on research, which is still in progress, while Professor A. Davies exposed " The False Latitudes and Longitudes of Columbus."

The well-organised and well-led excursions were a memorable feature of the meeting. Those on the Thursday afternoon gave the opportunity of either visiting the Black Country or studying the landforms of the Lickey and Clent Hills. The former was impressive in bringing out the extent of the blight of this area of rapid, unplanned mining and industrial expansion : 9000 acres of derelict land comprising slag heaps, colliery bings, huge marl pits, and water-logged and hummocky areas due to subsidence, 2000 acres reclaimed or being reclaimed for housing and recreation ; the vast areas of drab red brick houses ; the difficulties of transport, especially by canal ; and the most interesting regional differences within the Black Country itself. Saturday's excursions provided a sharp contrast, a choice being offered of the Welsh Border, or Stratford-on-Avon, Edgehill, and Warwick, while Sunday's, to Cannock Chase and Lichfield, included mines and mining settlements, heather-clad moors, agricultural and market-gardening land, and an old cathedral town. On the Tuesday afternoon a joint excursion with the Engineering and Economics section made a tour of the West Midland Regions Planning Area.

In addition to the sectional excursions there was a number of general excursions, including long ones to the Birmingham Waterworks in Wales, while, as befitted an industrial region like Birmingham and the Black Country, a very large number of visits to works of different types was organised.

C. P. S.

REVIEWS OF BOOKS

EUROPE

Island Going—to the Remoter Isles, chiefly Uninhabited, off the North-West Corner of Scotland. By ROBERT ATKINSON. 8½×5½. Pp. 384. 7 figs. 47 plates. End-paper maps. London : William Collins, Sons and Co. Ltd., 1949. 16*s*.

The book tells of the adventures of the author and his friend from 1935 onwards in their search for rare birds, and in particular Leach's Petrel, in the little known islands of the Outer Hebrides. Among the islands visited were North Rona, St. Kilda, the Shiant Isles, and Sula Sgeir. One does not require to be an ornithologist to enjoy the book, and we shall be surprised if the reading of this book does not tempt many of the younger generation to visit those islands and make older people long to do the same, although it may not be possible to them.

The author's style is unusual but attractive. Altogether a book well worth reading, and the illustrations are good. A. H.

The Cairngorms on Foot and Ski. By V. A. FIRSOFF. 8½×5½. Pp. 279. 49 photographs. Line drawings by the author. Map. London : Robert Hale Ltd., 1949. 15*s*.

When thinking about books on the Cairngorms, one's mind goes back to such books as *The Memoirs of a Highland Lady*, John Hill Burton's *Cairngorms*, or Macmillan's *Rothiemurchus*. This book lacks the charm of any of these. It deals with the author's expeditions in the hills during and after the last war, and in many cases gives considerably fuller details of routes, etc., than is contained in the Scottish Mountaineering Club guide book. To skiers his chapters on expeditions on ski should be of interest.

The wide plateaux and gentle slopes of the Cairngorms do not lend themselves to dramatic photographs, but the author has produced many pleasing views.

A. H.

Cumberland and Westmorland. By NORMAN NICHOLSON. 8½×5½. Pp. x+259. 49 illustrations. Map. [The County Books.] London : Robert Hale Ltd., 1949. 15*s*.

The ground covered extends from the rivers Esk and Eden to Morecambe Bay, from the Pennines to the sea, for the Lancashire districts of Furness and North Lonsdale are considered as geographically of the same region as Cumberland and Westmorland. The author acknowledges his debt to "all the archaeologists, geologists, naturalists, country parsons and poets of the last hundred years," but he writes with the fullness of knowledge of a man born and bred and continuing to live in the land that he describes in all its aspects. He writes in plain, straightforward language, with no abuse of superlatives, but nevertheless with the eye and pen of a poet.

Starting with the rocks and the landscapes, he deals with the vegetation and creatures great and small. But, as is fitting, three-fourths of the book are occupied with man, his relation to the soil, his history—often stormy, for Scotland was not far away—and his way of life to-day in the dales and in the towns. For the author, Lake Land is not a show piece but a place where men live and work. He does not believe that afforestation, railways, mines or waterworks need be a blight. He regrets the passing of many old industries having a clear relation to the land and their replacement by the tourist trade. While he recognises their economic importance, he does not love tourists in the mass, and makes various unflattering, if justified, references to some of them, as for example, "Wordsworth, like Shakespeare and Burns, gives rise to frantic pilgrimages on the part of non-readers."

But if this book finds all the readers it deserves, increasing numbers of tourists may yet heap coals of fire upon the author's head. The whole work is good, but from the point of view of mere human interest the chapters on mining, miners and the mining towns are most important : they contain much that is certainly not familiar to many summer visitors and students of geography. R. T. C.

Norfolk. By R. H. Mottram. 9×7. Drawings by Kenneth Rowntree. 55 photographs. 2 maps. [Vision of England.] London : Paul Elek (Publishers) Ltd., 1948. 9*s* 6*d*.

This little book is one of the attractive *Vision of England* series. Written by one who knows and loves Norfolk, the text is informative and readable, though, because of its limited length, inclined at times to become a catalogue of names. It is copiously illustrated with photographs, many of which are excellent, and with line drawings. There are also reproductions of a map by Speed and a Quarter Inch Ordnance map. A book to pass a leisure hour and to counteract the general impression of the county, summed up by Noel Coward as " Very flat—Norfolk."

H. P. W.

'*Twixt Foyle and Swilly*. By Harry Percival Swan, p.c., f.r.s.a.i., m.r.i.a. $8\frac{1}{2}\times5\frac{1}{2}$. Pp. xix+247. 155 illustrations. Sketch map. Dublin : Hodges, Figgis and Co. Ltd., 1949. 10*s* 6*d*.

This volume is about the little known peninsula of Inishowen, the most northerly part of Ireland, and is called a " guide book and conspectus of information." It is certainly the latter, including chapters with such varied titles as The Sloblands of Lough Swilly, Geology, Flora, Sea Fishing, Golf, Holy Wells, Saints, Landowners, and Poetry. The antiquities, of which there are many, are particularly fully dealt with. It is a pity that the layout does not allow easy reference, if used as a guide book, nor easy reading, if read for general interest. It does, however, contain valuable information for the intelligent tourist and the antiquary. H. P. W.

A History of Denmark. By John Danstrup. Translated into English by Verner Lindberg. 8×5. Pp. 195. 4 maps. Copenhagen : Wivel, 1948. *Kr*. 12.50.

The translator, judging by his name and by internal evidence in the work itself, is a Dane whose command of English is worthy of the greatest admiration, but the translation shows how subtle the use of the English article and prepositions can be. Only now and then does the Danish idiom shine through and rarely is an entirely wrong word used, but frequently a term is employed that is not just the one that a British writer would probably have preferred ; for example, " depiction " for " delineation," " common " for " communal," " pressed on " for " urged," " gave in to " for " yielded to " or " made way for." Occasionally a colloquialism appears where it would not have been expected. In fact the translation, good as it is, would have been improved if the text had been read by some friendly English scholar with a knowledge of Danish. This might also have saved some of the rather numerous misprints, not all of which are noted in the Errata, but it is creditable that there are not more of these.

The chief fault of the book itself is its brevity, for the vicissitudes in Danish history have been so many and so great and, in some epochs, so sudden that the narrative is of necessity too compressed. Even so, it is well worth reading, for it does give an impressive account of a subject which, in many of its parts, is anything but familiar in this country. The old questions that have arisen and been solved or left unsolved elsewhere are all here : The struggle for power between aristocracy and monarchy, elective kingship becoming hereditary and absolute and then constitutional, the rise of the middle classes, the very slow emancipation of the peasants. Most interesting for the British reader are likely to be the not altogether surprising revelation of the tremendous influence exercised upon Danish politics through many generations down to 1948 by Germans, and the exposition of certain social and cultural experiments, of the relations between the three Scandinavian powers, and of the long-standing and complicated question of Slesvig-Holstein. In time the book covers the whole ground from pre-history to the close of the late German occupation. In domestic policy at certain crises it has been easier to carry through changes because " there have been fewer abysmal class distinctions in Danish Society than in most other countries of Europe." As for foreign affairs, the deepest impression left, so far as the modern period is concerned, is that it must be extremely difficult for a small state situated like Denmark to maintain even a semblance of independence under the pressure of greater powers surrounding it.

There are several good maps, no index, and no bibliography. R. T. C.

Rome and its Environs. $7\frac{1}{4}\times4\frac{3}{4}$. Pp. x+84. 19 photographs. Map. [Les Guides bleus, English series.] Paris : Éditions Nagel, 1950. 250 *fr.*

The Sections on Rome have been extracted from *le Guide bleu* to Italy, for the convenience of visitors whose stay in Italy is limited to the capital. The street plan does not include some of the more recent systematisation in the central area.

C. J. R.

ASIA

Guide to 14 Asiatic Languages. By Andrew Boyd. $7\frac{1}{2}\times5$. Pp. x+262. London : The Pilot Press Ltd., 1947. 9*s* 6*d.*

In spite of the rather ambitious title the author is quite modest and has some sensible things to say in his introduction. He very properly states that the book is not for pundits, but it should certainly be serviceable to the people it is designed to help : English-speaking travellers in the East who are not primarily interested in language study for its own sake, but who do wish to get something, to go somewhere, to make known simple needs. The system of phonetics employed, though rough and approximate, is practical. Two points, matters of detail, require more attention. It is stated that *k* represents the sound of *k* in English and that *q* has the sound of *q* in *quay*. What sound is this if not *k* ? Either the symbol *q* should not be used at all or its function should be more clearly defined. In one or two cases some very necessary information is supplied about the stress or tonic accent ; in other cases where it is equally necessary such information is lacking.

Of the 14 languages one, Russian, is not strictly Asiatic ; it is included because of Russia's political and economic importance in Asia. The 14 languages are dealt with in three groups determined—with one exception, perhaps—on no very obvious linguistic principle but rather by the exigencies of space, the greater part of which is taken up by alphabetic word lists. The grammatical notes are generally good and to the point, but very brief. The Asiatic scripts are shown on the last few pages.

R. T. C.

AFRICA

Perspectivas económicas de Angola. By A. C. Valdez Thomaz dos Santos. 9×6. Pp. 235. 3 figs. 28 photographs. Lisbon : Agência Geral das Colónias, 1949.

The well-produced publications issued by the Portuguese colonial authorities are of marked interest and value to geographers. The present summary of economic conditions in Angola includes a demographic survey in addition to current information on transport, production, imports and exports, and foreign trade. The potentialities of the Colony are briefly surveyed and discussed in the final chapter of this useful work of reference.

I. E. C.

AMERICA

History of the Buccaneers of America. By James Burney, F.R.S. Introduction by Malcolm Barnes. $8\frac{1}{2}\times5\frac{1}{2}$. Pp. xvi+382. London : George Allen and Unwin Ltd. Reprinted (1912) from the edition of 1816. Second impression, 1949. 18*s.*

At least a shadow of legality hung over most of the actions of the seventeenth-century British, French, and Dutch seamen who, under the name of buccaneers, preyed on Spanish-American cities and commerce. Buccaneering was a semi-respectable occupation of sorts, and not to be confused with the straight piracy which replaced it after the Treaty of Ryswick.

The value of the reprinted work under review lies in the author's efforts to present a fair and unexaggerated record of events. Of especial interest is his account of the Anglo-French settlement of St. Christopher, the first break in the Spanish monopoly of territorial sovereignty in the Caribbean.

C. R. V. G.

OCEANIA

Tell the White Man : The Life Story of an Aboriginal Lubra. By H. E. THONEMANN. 8¼×5½. Pp. 190. 29 illustrations. End-paper sketch maps. London and Sydney : William Collins, Sons and Co. Ltd., 1949. 12*s* 6*d*.

Anyone who visits Australia and penetrates beyond the larger cities must be impressed with the problem of the Aborigines. One is apt to forget that they are the people of the country, and that the white men who have stolen their hunting grounds are the intruders. On the edge of the townships are their pathetic little homes, and one gets the impression that they have no object in life. In the northern Stations their lot appears to be happier, as both men and women are employed.

Mr. Thonemann, in the autobiography, translated into English, of an Aboriginal Lubra woman, shows how white men have upset the black's primitive laws and practices without supplying a bridge towards a more fully developed life. He also shows that a little understanding and wise direction can lead to the Aborigines living a much fuller and more useful life. It is probable that the same story might be written about natives in many other countries. A. H.

The Coral Sea. By ALAN VILLIERS. 8½×5½. Pp. 291. 37 plates. Maps by Stephen J. Voorhies. [Oceans of the World, 3.] London : Museum Press Ltd., 1949. 18*s*.

Mr. Villiers is a Master in sail, and only a seaman of the old school could write adequately of the waters between Melanesia and the Great Barrier, with their ubiquitous reefs and constant, terrible lee-shore. The most striking feature of this book is its effective portrayal of why this nightmare Sea remained uncharted and, indeed, unknown longer than any other in the tropical and temperate zones. *The Coral Sea* is primarily a record of the past, and can be very strongly recommended. It will appeal to the lover of colourful adventure and the serious student alike. The one weakness is lack of an adequate map. C. R. V. G.

POLAR REGIONS

A Camera in Antarctica. By ALFRED SAUNDERS, F.I.B.P., F.R.P.S. 10×7¼. Pp. 160. 72 photographs by the author. End-paper maps. London : Winchester Publications Ltd., 1950. 21*s*.

A criticism of many travel books is that they are monotonous in their detailed records and so are spun out to a boresome length. But here is the very reverse. Mr. Saunders compresses into a hundred and sixty pages an account of about fifteen years, including a year at South Georgia and at least two voyages round the world in *Discovery II*. The only part that is fully treated is his year at Grytviken, the whaling station at South Georgia. Was the publisher short of paper, or has the author too modest a valuation of his powers of writing ? The result is a tantalisingly short book. It is, however, superbly illustrated, especially as regards birds.

R. N. R. B.

That Frozen Land : The Story of a Year in the Antarctic. By DAVID JAMES. 8½×5½. Pp. 204. 30 illustrations. 2 maps. 1 plan. London : The Falcon Press Ltd., 1949. 12*s* 6*d*.

The Falkland Islands Dependencies survey is bound to bring a crop of Antarctic books, and if they are all as good as this they will be welcome. Antarctic exploration is no longer the old hit or miss business, with luck to help out careful planning. Times are easier now : ships and stations are not cut off from the world, and safety can be made more likely. The author was one of a party at Hope Bay in Graham Land, mainly for meteorological—and political—purposes. There is also an account of an important sledge journey down the east of Graham Land to about lat. 64° 30′ S. This was more like the exploration of old and showed how surface work is needed to amplify air survey. There are good maps and illustrations, and the book is a notable addition to the Antarctic library. R. N. R. B.

BIOGRAPHY

A Labrador Doctor. The Autobiography of Sir Wilfred Thomason Grenfell, K.C.M.G., M.D.(OXON.), F.R.C.S. Introduction by Sir Henry Richards, C.B., LL.D. 9×6. Pp. 350. Portrait. End-paper maps. London : Hodder and Stoughton Ltd., 1948. 15*s.*

The publication of this compound of *Forty Years for Labrador* and *A Labrador Doctor* is most acceptable. Grenfell's own saga is, or should be, familiar to all, and is one to be re-read. A review would be uncalled for, but his response to the award in 1930 of the Livingstone Gold Medal of this Society may perhaps be quoted here : " To be linked even in name with David Livingstone, a fellow medical man and one of my lifelong heroes, who, though passed beyond our sight, still functions as much, if not more, than during his visible stay on earth to inspire others, suggests a confidence among men we honour that does add ' power to the elbow,' which is more often needed than we always admit." I. E. C.

Nikolai Mikhailovich Przheval'skii. By N. M. Karataev. 8½×5¾. Pp. 284. Frontispiece. Map. [Nauchno-Populyarnaya Seriya.] Moscow and Leningrad : Akademiya Nauk SSSR, 1948. 15 *roubles.*

In the introduction to this volume of the popular scientific series issued by the Academy of Sciences of the USSR, S. V. Kalesnik, Scientific Secretary of the Geographical Society, very briefly evaluates the status of Przheval'skii as a naturalist-explorer of international as well as of Russian renown. Tribute is also paid to the late author of this biography.

Przheval'skii was born in Smolensk government in 1839, and died on a journey to Lhasa, at Karakol—renamed Przheval'sk—in Kirghizstan in 1888. During 1867-1869 he explored and mapped the Ussuri region, and in 1870-1873 made a notable journey through the Gobi to Pekin, thence to the Ala Shan and NE Tibet. An English translation of his account of this expedition was published in 1876, the year in which he set out on his second Central Asian expedition to Dzungaria. He was the first European since Marco Polo to visit the Lop Nor. After a brief sojourn in St. Petersburg in 1878, he led a third expedition, to Tibet, during the following two years. During 1883-1885, again entering Mongolia from Kyakhta, he explored the Tsaidam region and Kunlun, and spent fifty days at the Lop Nor. The next two years at home were also strenuous : work on his records and collections, and writing his book *From Kyakhta to the Sources of the Yellow River.* His fifth expedition was terminated by his death.

By his work as an explorer of the first rank, Przheval'skii not only made considerable contributions to geography : his collections of thousands of botanical and zoological specimens enriched the biological sciences. Przheval'skii's horse is perhaps better known to the public than are many of his other discoveries described in this valuable biography. The final chapter, on the personality of the explorer, ends with the obituary by Chekhov, who considered that " One Przheval'skii or one Stanley is worth ten educational institutions and hundreds of fine books."

The biography is remarkably objective, and the perhaps unavoidable ideological asides are few and do not detract from the merit of the book, which is well produced and is illustrated with a portrait of the explorer and a map showing his routes in China and Central Asia. A chronology and bibliography are appended, but, unfortunately, there is no index of names mentioned in the text. As of a number of other works issued by the Academy of Sciences, an English translation of this book would seem desirable. J. H. K.

EDUCATIONAL

Physical Geography. By Philip Lake. Revised and enlarged by J. A. Steers, G. Manley, and W. V. Lewis. Edited by J. A. Steers. 8½×5½. Pp. xxviii+410. 204 figs. 24 plates. 7 maps. Cambridge : University Press. Second edition, 1949. 15*s.*

This second edition in no way falls short of the aims set forth by the editor in his preface. The complete work is balanced and offered at a price well within the reach of the student's pocket. Again, as was the first edition [see *S.G.M.*, 1915,

31 (*4*) : 223], it is well suited for early work on the subject in the university : there are no serious omissions but, rather, there is justifiable focussing upon fundamentals. To the more advanced student it affords a suitable work of reference and in addition carries a satisfactory bibliography.

The book falls into three sections, each in itself an entity but not entirely divorced from the others, and, as in the first edition, the chapters on the atmosphere are best read consecutively. Photographs are excellent and diagrams both plentiful and lucid. R. C.

Fundamentals of Economic Geography. By Nels A. Bengtson and W. van Royen. Third edition revised in collaboration with A. Espenshade and P. Meigs. 10×7. Pp. xxviii+574. Diagrams, charts, graphs, photographs, and maps. London : Constable and Company Ltd. Third edition, 1950. 42*s*.

This useful text-book [see *S.G.M.*, 1947, 63 (*2*) : 93] has undergone considerable rearrangement of its contents and has been converted to the increasingly popular double-column format. As the authors indicate in the preface to this edition, the book is not intended for the specialist in geography but for students in related fields and for others interested in problems of natural resources.

The introductory chapters on the objectives of economic geography have been rewritten, and the section on general aspects of the earth's surface has been completely rearranged. There is little change in the chapters on agriculture, forests, and fisheries ; on the other hand, there is considerable revision in those on coal, petroleum, and water-power, while a curious omission in previous editions has been remedied with a chapter on ferro-alloys. The only other completely new chapter is that on transport. The bibliographical references throughout the book, a most useful feature, are almost entirely new. The value of the illustrations, to which there is also a number of additions, has been greatly enhanced by the use of glossy paper. C. J. R.

An Historical and Political Geography of Europe. By N. J. G. Pounds, m.a., ph.d. 8×5½. Pp. 540. 163 figs. London : George G. Harrap and Co. Ltd., 1947. 25*s*.

The title, large as it is, does not suggest the actual scope of the book, for the reader who works through it will have circumnavigated the globe once or twice. The author justly insists that the boundaries between geography, history, and economics are difficult to define and that in political geography it is impossible to remain up to date. One need only think of recent happenings in Palestine, India, Indonesia, and the Far East to appreciate the truth of the last observation.

A work of this kind may seem, as it is planned and carried out, almost too comprehensive for one volume, but it should be welcomed by intelligent students, for it will help to correct a grave weakness encouraged by the usual secondary school curriculum, the separation of knowledge into water-tight compartments. The book was originally designed for use in sixth forms but afterwards extended in the hope of appealing to a wider public. May that hope be fulfilled !

The book starts with an account of the physical basis of Europe, stressing its great variety, and deals with the main subject in four parts : ancient and medieval times ; modern times ; the contemporary scene ; extra-European relations. The course of the early discoverers takes us all round the world and back again to the countries of Europe with all their geographical and historic problems. Discussion of colonies brings us again to the ends of the earth. The number of important questions that arise is legion ; many of them are, of course, still in debate. But it is all very interesting and not least the pages devoted to different types of frontier and to varying conceptions of empire. It is a merit rather than a defect in a book of this kind, which, to be read with profit, must be studied in sections, that the author does not hesitate to repeat occasionally statements of fact or considerations that have already been made in other connections.

The conclusion is occupied with certain philosophical matters, all of interest, mostly controversial, and perhaps a little beyond the reach of the readers for whom the book was first intended.

The numerous useful maps are based upon Droysen's *Historischer Handatlas* and Sprüner-Menke's *Handatlas*. Bibliographies are given with each chapter.

R. T. C.

The Parish Church. By PATRICK THORNHILL. 8½×5½. Pp. 48. Illustrated. [The Get to Know Series.] London : The Pilot Press Ltd., 1948. 2*s*.

A most commendable little reference book for boys and girls, which contains simple questions which they can answer by direct observation. Text and illustrations give adequate information on the English parish church : its plan, architecture, ornaments, furnishings, building materials, etc. ; and the history of the parish church is illustrated with a time-chart indicating the order in which the styles succeeded one another. I. E. C.

GENERAL

Les Fondements de la Géographie humaine. By MAX. SORRE. 10×6½. Tome II. Les fondements techniques. Deuxième partie. Les techniques de production et de transformation des matières premières. Pp. 611-1031. Figs. 36-61. Paris : Armand Colin, 1950. 1000 *fr.*

With the publication of the second part of volume two of his *Fondements* Professor Sorre has completed his survey of the technical basis. The first volume, on the biological basis, has already been reviewed here [*S.G.M.*,1949, 65 (*2*): 108-109]; the third volume, on the *habitat*, is still to come. Until the concluding volume appears it will, of course, be impossible adequately to assess the author's treatment. In the complete work Professor Sorre is surveying what, for the sake of division of labour and the convenience of academic curriculum-makers, are commonly known as economic geography, political geography, and the less traditionally differentiated topics that remain under the generic title of social geography and are still only in process of being ' cornered ' by the academic specialists.

The author's approach is historical. In these volumes he is describing what he terms " the struggle through the vicissitudes of a long history to impregnate the natural landscape with humanity." Survival, he holds, does not depend on perfect adjustment. In other words, stable equilibrium is rather an unusual condition.

In the middle section, comprising probably half of the complete work, the author differentiates four groups of techniques : (1) techniques of social life, corresponding to the traditional political geography, with the inclusion of linguistic and religious geography—here Professor Sorre bestows on the apparent corpse of *Homo oeconomicus* one more kick ; (2) techniques of energy sources ; (3) the conquest of space (development of communications) ; (4) techniques of production and processing of food and raw materials.

It is with the last of these groups that the second part of volume two is concerned. Half of this part is given to agriculture, fisheries and forests, half to minerals and manufactures. The author, following De Martonne, adopts Chevalier's classification of agricultural systems, while admitting it to be of only didactic interest. Minerals receive relatively much briefer treatment, with a short sketch of metallogenetic provinces. Attention is drawn, however, at the beginning of this part to the increasing population employed in the processing of minerals. In the conclusions of this part the greater weight is thrown on increasing contrasts between agriculture and industry with the advance of technique, contrasts both in way of life and in output per man that are of deeper significance than those between rural and urban areas. Finally, Professor Sorre draws together some lines of thought on the four groups of techniques into a brief sketch of various types of economy. We shall await with lively anticipation the author's summing-up of the whole work in the concluding volume of this massive survey. C. J. R.

History. By V. GORDON CHILDE. 7½×5. Pp. 86. 10 illustrations. [Past and Present, Vol. 6.] London : Cobbett Press Ltd., 1947. 7*s* 6*d*.

Attention has already been drawn to other volumes of this valuable series of studies in the history of civilisation [*S.G.M.*, 63 (*1*) : 44 ; 64 (*1*) : 59, 167 ; 65 (*1*) : 62]. In the present volume, Professor Gordon Childe deals most lucidly with the theories of historical order, leading to the final chapters on history as a comparative science and as a creative process. " If history be not following a prescribed route but is making its path as it proceeds, the search of a terminus is naturally vain. But a knowledge of the course already traversed is a useful guide to the probable direction of the next stage of the way." I. E. C.

THE GEOGRAPHICAL MAGAZINE

As noted in *The S.G.M.*, 1948, Vol. 64, No. 3, members of the Royal Scottish Geographical Society enjoy the privilege of subscribing to *The Geographical Magazine* at a special rate. Members who have already subscribed have been notified of an increase in price. On October 1st, 1950, the standard annual subscription rate has been raised from 20*s.* to 27*s.*, and the special rate to members, from 15*s.* 6*d.* to 21*s.*

ROYAL SCOTTISH GEOGRAPHICAL SOCIETY

PROCEEDINGS

MEETINGS OF COUNCIL were held on the 17th October and 28th November, 1950.

ANNUAL GENERAL MEETING

The Annual General Meeting was held in the Society's Rooms in Edinburgh, 3rd October 1950, Dr. Douglas A. Allan in the Chair.

The Chairman opened the meeting and tendered Prof. A. G. Ogilvie's the retiring President's sincere apologies for being absent owing to a slight indisposition. This was the more regrettable as the meeting marked Professor Ogilvie's termination of four years in office as President, and the meeting warmly acknowledged the valued and unremitting work accomplished by him during that period.

The Annual Report of the Council and the Financial Statement were unanimously adopted : the meeting recording its satisfaction at the increase in Membership at the Aberdeen and Dundee Centres.

The excellent work of Col. T. E. Durie in cataloguing and arranging the Map Collection was noted with appreciation.

The following members of the Society were unanimously elected to be :—

(*a*) President and Chairman of Council :—J. Bartholomew, M.C., J.P.

(*b*) Vice Presidents :—Prof. Alan G. Ogilvie, O.B.E., F.R.S.E. ; Alexander Harrison, C.A.

(*c*) Members of Council :—Sir James D. Anderson ; William Burns ; John B. Fleming ; Arthur Geddes ; Alexander Good ; Albert B. Hyslop ; William Latimer ; Henry M. Paton ; Francis D. N. Spaven ; J. S. Russell Thomson (*Glasgow*).

(*d*) Vice-Presidents serving on Council :—Douglas A. Allan ; Douglas Guthrie ; Alexander Harrison ; Alan G. Ogilvie ; Arthur W. Russell ; J. Cameron Smail.

(*e*) Chairman of Branches :—*Glasgow :* John Johnston ; *Dundee :* John Watson ; *Aberdeen :* William Clark Souter.

The other Office-bearers were re-appointed.

The Chairman then read the retiring President's prepared address as follows :—

I have come to the end of my Presidency and, looking back over the four years, I realise that this period following the war has been marked by difficulty for the Society, as it has been for most other associations of the kind in this and in many other countries. The most obvious difficulty has been financial, and in our case this is due not merely to rising costs, but also to our assumption of greater responsibilities. Yet such a policy is surely healthy, and I believe it will be justified by results. The Council were determined to make our collection of books and periodicals more useful to the members, and this involved reorganisation and cataloguing. Again, we accepted custody of a vast collection of topographic maps, of nearly all parts of the world, offered by the Government through the Director of Military Surveys. We considered it important that the public should have proper access to this collection of the latest surveys produced during and since the war, because it is the only one in Scotland ; so we extended our rooms and incurred a large expense in providing cases and in cataloguing and arranging the maps. We can now rest assured that, with this work done, valuable service will be rendered to a widening

circle of users, as the collection becomes known. We have acknowledged most gratefully a grant from the Pilgrim Trust in aid of book-binding that had become overdue during the war ; also our annual grant-in-aid from the Treasury has been maintained, though not increased. Nevertheless we have to note that in the main we must perform this national service in relation to the map collection at the expense of our ordinary funds.

I turn next to certain renewed activities which involve increased responsibility. The Society's interest in Scottish place-names, formerly due largely to the late John Mathieson, has been recognised by the Ordnance Survey. Our Place-Names Committee, strengthened by the several experts in the Universities, has recently revised the Short Glossary to be reissued soon by the Director-General. Furthermore it has agreed to undertake, for the Survey, a check of the spelling of all the names on the " one-inch " map, in preparation for a new edition. This is a very large task, and it is likely that the Committee will be able to carry it out only with the help of many other people. We hope that volunteers will be found who will be interested in the improvement of the national map and will give up some of their spare time to the essential preliminary work of searching the records for the older spellings of names ; the Committee, of course, will give the necessary guidance. Another Committee is preparing to contribute to the knowledge of Scottish historical geography by gathering information about old plans of estates and by promoting the preservation and use of these valuable documents wherever they may be. This study of the geography of the past is an important factor in the proper interpretation of many aspects of the life of the people of Scotland. It will therefore form part of the work of the Institute of Scottish Studies which the University of Edinburgh is setting up, with the help of the Carnegie Trust for the Universities. Consequently this Society is one of those whose co-operation is to be sought ; and rightly so, for geography is obviously involved in the distribution of such things as racial strains, dialect, social organisation, evolution of land tenure, and so on.

The Society has continued to participate in the work of other bodies which have important practical aims, such as the National Trust for Scotland, and it is represented on their Councils. Again, through the National Committee for Geography we are in close touch with the activities of the International Geographical Union ; at present our members are serving on three of its working Commissions: those dealing respectively with the geography of disease, the geography of seaports, and the best way of studying population from the geographical point of view.

But the main contribution of the Society to the progress of geography is still made by the publication of *The Scottish Geographical Magazine*. It is therefore most unfortunate that we are hampered by financial restrictions just when geographers all over the world are showing a renewed interest in the Magazine that is justified by the value of the papers it contains. It is indeed desirable on all counts that we be enabled again to issue at least four parts annually.

It is evident, then, that the membership must be increased if the Society is to continue to flourish and to fulfil its responsibilities. To this end I think we have arranged for a really interesting programme of lectures for the present session. This provides for no less than twenty-six meetings, and they should serve the most varied interests. The opening lecture will deal with the main problem of the Far East as seen by a geographer, and this is to be supplemented later by an objective account of Formosa. Locust plagues, which form a vital factor in the world's food situation, are to be discussed by a leading authority, while the capacity of the Scottish hills to produce food is to be treated by another. Three important lectures will deal with British colonial territories ; and I must mention the special lecture in February on the Scottish Mountaineering expedition to the Garhwal Himalayas. This must suffice to indicate the interest of the general programme ; but I should allude to our effort, begun last year, to get young people into the Society, by the creation of " Junior Membership." Six of the meetings are specially arranged for them, and again subjects are chosen to suit varied tastes.

As I have said here on various occasions, geography touches almost every facet of life. Hence our membership has naturally represented a fair cross-section of the more enlightened citizens. Long may it continue to do so. But before I hand over this Office I may be permitted to look forward to a progressive change that is already apparent. As a professional geographer and a teacher I note with satisfaction

that more and more citizens have acquired, in their education, considerable knowledge of the method of systematic geographical study, and an appreciation of the benefits that accrue from it. I need not go beyond my own experience in the University of Edinburgh ; since 1923 nearly four thousand students have qualified in geography. Some of these are fully trained geographers ; but for the vast majority the subject has been subsidiary to others, and they are to be found in a great variety of occupations. A considerable proportion of them must be living in the cities where our Society operates, and if most of these were members I feel sure that both they and the Society would benefit greatly.

In concluding my final address from this chair, I wish to thank the members for the support they have given the Society during the past four years ; and I am particularly grateful to the Officers, the Council and the Staff of the Society for their help in the conduct of its affairs. I relinquish the Presidency in full confidence that the Society will continue to prosper under the guidance of my successor. No one knows better than I with what devotion Mr. John Bartholomew has served it as Honorary Secretary during the past thirty years.

LECTURE SESSION

October-December, 1950

November 30th. *Usher Hall.* W. H. Murray, on "The Scottish Himalayan Expedition, 1950." Kodachrome slides.

January-March, 1951

EDINBURGH, *Usher Hall*

Evening Meetings—Thursdays, at 7.30 p.m.

January 11th. Arthur Wannop, o.b.e., b.sc.(agr.), b.eng., on "Food from our Hills." Illustrated.

February 15th. Sir Paul Dukes, k.b.e., on "The Geographical Factor in Russian History." Illustrated.

March 15th. The Rt. Hon. Lord Kinross, on "Cyprus." Illustrated.

Central Hall, Tollcross

Afternoon Meetings—Wednesdays, at 3 p.m.

January 17th. John C. Bartholomew, m.a., on "Iceland." Illustrated.

January 31st. Kathleen M. MacIver, b.a., on "Uganda Journey." Illustrated.

February 21st. Marc A. Bera, e.n.s., on "La Basse Normandie." Illustrated.

March 7th. George Shepperson, m.a., on "Europe and Tropical Africa." Illustrated.

March 21st. Francis D. N. Spaven, m.a., on "Syrian Villages." Illustrated.

The Society's Rooms, Synod Hall

Current Geographical Problems

Friday, at 5 p.m.

February 7th. H. P. White, b.a., on "Some Rural Problems in the Border Counties."

Junior Members' Meetings—Tuesdays, at 7.30 p.m.

(Illustrated Talks)

January 16th. Isobel W. Hutchison, ll.d., on "A Stroll to Venice through the Dolomites."

February 20th. A Canadian, on " Modern Canada."
March 20th. Dr. K. A. Steer, on " Archaeology and Air Photography."

GLASGOW, *Lyric Theatre*, at 7.30 p.m.

January 10th. Arthur Wannop, o.b.e., b.sc.(agr.), b.eng., on " Food from our Hills." Illustrated.
February 14th. Sir Paul Dukes, k.b.e., on " The Geographical Factor in Russian History." Illustrated.
March 21st. S. J. Jones, m.a., on " California." Illustrated.

ABERDEEN, *Y.M.C.A. Hall*, at 7.45 p.m.

January 9th. Patrick W. R. Petrie, o.b.e., m.b., ch.b., on " Yemen." Illustrated.
February 13th. Sir Paul Dukes, k.b.e., on " The Geographical Factor in Russian History." Illustrated.
March 13th. Surg.-Commander G. Murray Levick, f.r.g.s., f.z.n., r.n. (Retd.), in " The British Schools Exploring Society's Expedition to Northern Quebec." Illustrated.

DUNDEE, *Training College, Park Place*, at 7.30 p.m.

January 10th. Patrick W. R. Petrie, o.b.e., ch.b., on " Yemen." Illustrated.
February 12th. Sir Paul Dukes, k.b.e., on " The Geographical Factor in Russian History." Illustrated.
March 14th. Surg.-Commander G. Murray Levick, f.r.g.s., f.z.n., r.n. (Retd.), on " The British Schools Exploring Society's Expedition to Northern Quebec." Illustrated.

NEWBIGIN PRIZE : 1951 AWARD

A Bronze Medal and Money Prize will be awarded for the best Essay, suitable for publication in *The Scottish Geographical Magazine* and not exceeding 7000 words in length, on any subject relating to the geography of Scotland.

Essays, typed and with any illustrations prepared for reproduction, in envelopes marked " Newbigin Prize," must be lodged with the Secretary, Royal Scottish Geographical Society, Synod Hall, Edinburgh 1, on or before October 31st, 1951.

SCOTTISH UNIVERSITIES MEDAL

The Scottish Universities Medal was awarded to Thomas Ian Rae, University of St. Andrews, *not* University College, Dundee, as stated in error on page 127 of the current Volume.

NOTICE

The following numbers of *The Scottish Geographical Magazine* are out of stock and are very urgently required :—Vol. **2**, No. 3 ; Vol. **13**, No. 11 ; Vol. **19**, Index ; Vol. **20**, No. 5 ; Vol. **22**, No. 6 ; Vol. **26**, No. 3 ; Vol. **34**, Nos. 3, 4, 10, 12 ; Vol. **35**, Nos. 1, 3, 8, 9 ; Vol. **36**, No. 1 ; Vol. **37**, No. 1 ; Vol. **41**, Nos. 2, 6 ; Vol. **47**, No. 6 ; Vol. **53**, No. 1 ; Vol. **58**, Nos. 1, 2, 3 ; Vol. **59**, Nos. 1, 2 ; Vols. **58-59**, Index ; Vol. **60**, No. 2 ; Vol. **61**, No. 2.

All bound volumes will also be gratefully accepted. It would be much appreciated if such copies of separate numbers and of volumes be handed without delay to the Secretary.

ROYAL SCOTTISH GEOGRAPHICAL SOCIETY

REPORT OF COUNCIL

SIXTY-SIXTH SESSION, 1949-50

(For the ten months 1st July 1949 to 30th April 1950)

THE Council have the honour to submit the following Report :—

MEMBERSHIP

The changes during the Session are as follows :—

On the Roll at 1st July 1949		2059
New Members		370
		2429
Deduct by Death	28	
„ Resignation	342	
		370
On the Roll at 30th April 1950		2059

In order that Members can see at a glance the fluctuations in the different categories of Membership at the four Centres of the Society, the total Membership is analysed thus :—

	30/6/49	*30/4/50*		*30/6/49*	*30/4/50*
Edinburgh			*Glasgow*		
Life	221	242	Life	22	22
Ordinary	973	861	Ordinary	337	297
Associate	110	109	Associate	1	3
Junior	—	129	Corporate (Schools)	26	24
Corporate (Schools)	16	14	Y.M.C.A. (10s. Members)	20	—
Aberdeen			*Dundee*		
Life	5	5	Life	2	2
Ordinary	124	141	Ordinary	43	51
Associate	—	1	Corporate (Schools)	1	—
Corporate (Schools)	1	—			
Outside Area Members	133	131	*Honorary Members*	24	27

Attention is drawn to the satisfactory total of 129 in the newly inaugurated Junior Membership.

MEDAL AWARDS

THE NEWBIGIN PRIZE MEDAL was awarded to : 1948—Mrs. Isobel M. L. Robertson, B.Sc. ; 1949—Andrew T. A. Learmonth, M.A.

MEETINGS OF THE SOCIETY

The Society held forty-five Meetings during the Session. In Edinburgh : six Lectures in the Usher Hall ; ten Wednesday Afternoon Lectures in the Central Hall, Tollcross ; one Special Lecture in the Central Hall, Tollcross ; six Technical Papers and two Discussions in the Society's Rooms ; and two Film Shows for Young People in the Synod Hall.

Six Lectures were held in the Lyric Theatre, Glasgow ; six in the Training College, Park Place, Dundee ; and six in the Y.M.C.A. Hall, Aberdeen. Lectures are currently listed in the *S.G.M.*

Library and Map Department

With the exception of the final cataloguing of the books the rearrangement, indexing and cataloguing of the Society's maps and books has now been completed.

The following additions were made :—285 books ; 12 reports and 20 pamphlets ; 145 books were presented and 14 purchased. The free issue of G.S.G.S. publications has continued to enrich the Society's map collection.

During the Session 2332 books, 155 map and chart sheets, and 196 lantern slides were issued to members.

The Council desire to thank all those who have so kindly supported the Society with the presentation of books, maps, charts, lantern slides and films.

The Scottish Geographical Magazine

Three numbers of the Magazine have been issued during the year, and the contents serve to show once more the deep obligation of the Council to those who have contributed original papers and reviews, as well as to authors and publishers at home and abroad who have generously sent current geographical publications.

Grants to authors of research papers towards the cost of illustrations have again been made by the Carnegie Trust, to whom grateful acknowledgments are also due.

Donations

During the period to 30th April 1950 a further sum of £160 has been received from the Trustees of the late Ralph Richardson, W.S., a former Honorary Secretary of the Society, under whose Will the Society has now received £27,663, 10s. 1d. bequeathed to the General Funds of the Society. A further sum will be received when the Estate is wound up.

The other Donations to the General Funds of the Society, received during this Session, amounted to £196, 18s. 2d., of which the following were received under Covenant :—Dr. James Watt's Trustees, £45 ; Anonymous, £90, 18s. 2d. The late Miss I. M. Hayward bequeathed a Legacy of £50 free of Duty along with Projector and Films. Anonymous donations of £10 and £1 were also received.

The Society's Representatives

The following Members were appointed to represent the Society :—

Association for the Preservation of Rural Scotland.—Rev. Archibald E. Robertson.

Scottish Council for National Parks.—Lt.-Col. Gordon Dalyell of the Binns.

Bruce Memorial Prize Committee.—James M. Wordie ; Professor R. N. Rudmose Brown.

Carnegie United Kingdom Trust : General Council of the Central Library for Students.—Robert R. Walls.

Joint Committee for Anthropological Research and Training.—Robert Kerr.

National Committee for Geography.—Professor Alan G. Ogilvie.

National Trust for Scotland.—Professor Alan G. Ogilvie.

Permanent Committee on Geographical Names.—John Bartholomew.

Scottish National Memorial to David Livingstone.—Lt.-Col. John Johnston.

National Institute of Oceanography.—Professor Alan G. Ogilvie.

Obituary

It is with deep regret that Council record the loss to the Society of the late Secretary, Mr. George Walker, F.R.S.G.S., and of 28 Members by death, among them Dr. Hugh Robert Mill, D.SC., LL.D., a foundation member and Gold Medallist of the Society.

ROYAL SCOTTISH GEOGRAPHICAL SOCIETY

ORDINARY REVENUE AND EXPENDITURE ACCOUNT

For Period of ten months to 30th April 1950

REVENUE

SUBSCRIPTIONS :—		
Ordinary		£1,985 16 3
Schools Corporate		112 19 0
Junior Members		64 0 0
		£2,162 15 3
LIFE MEMBERSHIP FEES :—		
Portion applicable to Revenue		106 12 2
GOVERNMENT GRANT		200 0 0
GENERAL DONATIONS		146 18 2
		£2,616 5 7
DIVIDENDS AND INTERESTS : Normal	£950 19 11	
Arrears, 1948-49	274 7 4	
	£1,225 7 3	
Less—Provision for Amortisation	274 7 4	
		950 19 11
		£3,567 5 6

Although period of Accounts is ten months the Revenue received represents practically that for a full year.

EXPENDITURE

MAGAZINE—Expenses of Publications :—			
Printing			£425 11 3
Editor			76 5 0
Illustrations			106 16 10
Wrappers, Index and Miscellaneous			6 10 2
Postages			42 12 11
			£657 16 2
Less—Current Magazines sold	£187 6 4		
Advertisements	75 0 0		
		262 6 4	
			£395 9 10
ROOMS—Upkeep of :—			
Rent, Rates and Insurance	£116 11 6		
Cleaning and Repairs	37 5 0		
Heating and Lighting	67 14 9		
	£221 11 3		
Less—Donations	69 0 0		
		152 11	
LECTURES	£730 17 7		
Less—Received for Tickets sold	177 5 9		
		553 11 10	
SALARIES			916 14 3
AUDITOR'S FEE			15 15 0
SUPERANNUATION CONTRIBUTIONS			—
LIBRARY—Books, Maps and Furnishings			519 15 7
PROVISION FOR CURRENT AND DEFERRED EXPENDITURE			683 0 0
GENERAL PRINTING			142 2 10
STATIONERY			82 8 2
TELEPHONE AND TELEGRAPHIC ADDRESS			11 11 2
ADDRESSOGRAPH			26 19 11
MEDALS			15 15 4
POSTAGES			118 12 0
MISCELLANEOUS			79 10 9
			£3,713 17 11
Less Deficit for Period of ten months			146 12 5
			£3,567 5 6

BALANCE SHEET as at 30th April 1950

ASSETS

I. INVESTMENTS :—		
£400 3% Defence Bonds		£400 0 0
£850 2½% do.		850 0 0
£5,000 2½% National War Bonds 1954-56		5,114 17 3
£2,500 3% National Defence Loan 1954-58		2,613 2 0
£2,000 3% War Loan 1955-59		2,100 8 0
£5,000 3% Savings Bonds 1955-65		5,166 8 6
£4,106, 3s. 3d. do. 1965-75		4,173 17 4
£5,500 3½% Conversion Stock 1961		5,772 13 6
£890 2½% Guaranteed Land Stock		500 13 6
£2,113, 18s. 8d. British Gas 3% Guaranteed Stock 1990-95		2,119 12 4
£2,603, 10s. 11d. 3% Savings Bonds 1960-70		2,552 1 6

LIABILITIES

I. ACCOUNTS OUTSTANDING			£35 12 9
II. PREPAID SUBSCRIPTIONS			17 6 4
			£52 19 1
III. RESERVES, etc.—			
Glasgow Equipment Fund—Balance at 30.6.49	£60 4 0		
Provision for Current and Deferred Expenditure, for Books, Maps, Atlases, Binding Equipment, Furnishings and Exhibitions as at 30.6.49	1,297 4 4		
	£1,357 8 4		
Add—Further Provision for above	683 0 0		
Early Magazine Sales	85 19 9		
		2,126 8 1	
IV. GRANT FROM PILGRIM TRUST FOR BINDING AS AT 30.6.49	£120 0 0		
Less applied to cost of binding during period to 30.4.50	120 0 0		—

	£33,915 15 4	
Less—Provision for Amortisation to date	324 7 4	
	£33,591 8 0	
II. Sundry Debtors	5 0 0	
III. Cash in Bank and on Hand	1,629 6 10	
	£35,225 14 10	

V. Funds of the Society—			
(*a*) Life Membership Fund—			
Balance at 30th June 1949		£1,944 10 4	
Sums received during period to 30.4.50		187 13 6	
		£2,132 3 10	
Less—Sum transferred to Revenue Account		106 12 2	
		£2,025 11 8	
(*b*) Dr. J. G. Bartholomew Fund		1,000 13 6	
(*c*) J. E. Touche Bequest—			
Balance at 30th June 1949		608 1 4	
(*d*) Ralph Richardson Bequest—			
Balance at 30th June 1949	£27,503 10 1		
Sums received during period to 30.4.50	160 0 0		
	£27,663 10 1		
Less—Deficit on change of Investments	12 5 7		
		27,651 4 6	
(*e*) General Funds, including Bequests from T. F. Thompson, Dr. J. Currie, J. D. Munro, J. Bentley Philip, A. Geddes Scott, Miss Morrison, R. T. Skinner, Miss Julia Blanchard and Miss Ella Christie—			
Balance as at 30.6.49	£1,857 9 1		
Miss I. M. Hayward Bequest	50 0 0		
	£1,907 9 1		
Less — Deficit for period to 30.4.50	146 12 5		
		1,760 16 8	
			33,046 7 8
			£35,225 14 10

LIVINGSTONE MEDAL FUND

Funds as at 30th June 1949		£1,694 8 6	
Income Received—Interest on Stocks		48 14 9	
		£1,743 3 3	
Funds as at 30th April 1950—			
£1,390 3% Savings Bonds 1965-75		£1,390 0 0	
£123, os. 8d. do. 1965-75		125 8 0	
£150 2½% Defence Bonds		150 0 0	
			£1,665 8 0
Cash in Bank			77 15 3
			£1,743 3 3

DR. M. I. NEWBIGIN MEMORIAL

Funds as at 30th June 1949		£444 6 6	
Income Received—Interest on Stocks		11 17 10	
		£456 4 4	
Expenses *re* Medals			—
Funds as at 30th April 1950—			
£333, 18s. 6d. 3% Savings Bonds 1965-75		£339 6 6	
£75 2½% Defence Bonds		75 0 0	
Cash in Bank		41 17 10	
			£456 4 4
			£456 4 4

Edinburgh, 6th June 1950.—I have examined the Accounts of the Royal Scottish Geographical Society for the period to 30th April 1950, of which the above is an Abstract, and compared them with the Vouchers and Instructions thereof, and I find the whole to be correctly stated and sufficiently vouched and instructed.

J. A. ROBERTSON DURHAM, C.A., *Auditor.*